Best may already be

No. 29,407

Tuesday August 28 1984

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NEWS SUMMARY

GENERAL

N-cargo salvage plans begin

Two salvage companies, one Dutch, one Belgian, were given the task of recovering 30 containers of manium hexaluoride, a radioactive gas, um hexafluoride, a radioactive gas, which were on board a French-owned cargo vessel which sank off the Belgian coast on Saturday.

Owners of the Mont-Louis, which was carrying 225 tonnes of radioactive material to the Soviet Union, said that two to three weeks would be needed for the salvage work. Earlier the French Government had urged a rapid salvage.
The two companies given the

task are L'Union de Remorquage et de Sauvetage of Belgium and Smit Kat International of Holland.

Bangladesh strike

A nationwide strike against martial law in Bangladesh virtually paralysed most cities. Police said 50 people were injured in clashes between opposition and government supporters in Dhaka.

Gandhi campaign

Mrs Gandhi's ruling Congress (I) Party in India has launched a campaign to extricate itself from a constitutional row over the dismissal of former film star Mr N. T. Rama Rao from the job of Chief Minister of Andhra Pradesh, Page 3

S. Africa protest

Thousands of Indian students boycotted classes in South Africa in protest at elections today for a new parliament. Police reported violence in townships near Pretoria. Namihia talks, Page 3

Tanker attacked The Panamanian registered tanker

Cleo 1 was set on fire in a rocket attack in the Gulf. The raid appeared to be Iraman retaliation for an Iraqi attack on another tanker last Friday. Page 2

Sharon wants Jordan

Former Israeli Defence Minister Ariel Sharon said Jordan rightfully belonged to Israel and would one day be settled by Jews, an Israeli newspaper reported. Confition bid, Page 2

Trial to resume

Hamburg court rejected a defence contention that the six judges in the "Hitler Diaries" case were not quali-fied to give journalist Gerd Heidemann a fair trial because of previous publicity. The trial resumes to-

Shuttle tries again

. 44

light

Acres 42.27

Discovery, the third U.S. space shuttle, is due to make its maiden voyage tomorrow. Two attempts in June were stopped by mechanical

Oil concessions

Egypt signed four oil exploration ions with U.S. and British companies worth a total of \$201.7m. The agreements cover offshore areas in the Gulf of Suez, the Mediterranean and the desert east of Cairo. Page 4

Syrian disquiet

Libya's agreement on a "state of union" with Morocco appears to have badly strained relations with its firmest Arab ally, Syriz. Page 3

Prague celebration.

Soviet Defence Minister Dmitry Ustinov flew to Prague to represent the Kremiin at celebrations markthe Kremin at cel ing the 40th anniversary of an anti-Nazi rebellion in Slovakia.

'Arkaeology' find

Rocks and decayed wood from Mount Ararat that biblical archae ologists hope are remnants of Noah's Ark have been brought to the U.S. for laboratory analysis, an expedition spokesman said.

BUSINESS

Arco to write down \$785m

ATLANTIC RICHFIELD oil group of the U.S. said it would suffer write-down of \$785m in the third quarter from its metals and miner als operations. It also plans to repurchase 25m shares, about 10 per cent of its issued equity.

CURRENCIES continued to trade quietly within the European Mone tary System last week. Activity slowed as the dollar lost direction and there appeared to be little inbefore the dollar gains tresh impe tus. French interest rates touched a 3½ year low, but the Bank of France

rate unchanged. Belgian rates were also a little easier and although the

Belgian franc was as little weaker

overall, it was placed comfortably

TOKYO: Nikkei-Dow market closed

5.06 higher at 10,568.72 in light trad-

STERLING was unchanged in New

DOLLAR advanced in New York to DM 2,8855 (DM 2,86725), FFr 8,8680 (FFr 8,8025), SwFr 2,407 (SwFr 2,381) and Y241.95 (Y240.75).

GOLD lost \$1.05 in Zurich to

\$348.50. In New York the Comex

FRENCH borrowing abroad this

year is running at a considerably faster pace than the Government had anticipated. Page 2

WEST GERMANY'S chemical in-

dustry expects to boost production by 5 per cent in real terms this

NEGOTIATIONS between the Phil-

ippines Government and the IMF on an SDR 615m (\$621m) standby credit have reached a critical phase

as pessimism deepens over the

country's long-term economic pros-

THAILAND launched an interna-

tional advertising campaign to en-

courage new bids of up to \$500m, to

double capacity at the Thai Oil Refining Company near Bangkok. Page 12

PROPOSALS for a multi-year re

scheduling of Mexico's public sector debt, will be sent to its creditor

banks early next month, Mr William R. Rhodes, Citibank vice-chair-

man, said after "substantial pro-gress" was made at negotiations over the weekend. Page 12

Production difficulties in London

may have resulted in typographical errors in unit trusts, some adver-tisements and elsewhere in today's

August settlement was \$348.60.

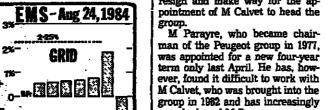
within its divergence limit.

1 227 92. Section II

ing. Section II

York at \$1.307.

year. Page 2



to force a boardroom showdown, suggesting he would step down if the present senior management

Peugeot chiefs in boardroom battle to control group

BY PAUL BETTS IN PARIS

AN INTERNAL battle over the running of Peugeot, France's largest private enterprise, has erupted at a crucial moment for the troubled car company, which is pressing ahead with large-scale redundancies in its efforts to cut losses.

M Jean-Paul Parayre, group chairman, has called a board meeting next week to resolve an internal dispute with M Jacques Calvet, former chairman of Banque Nationale de Paris (BNP) who is now in charge of the day-to-day running of Peugeot's entire car operations, em-bracing the Peugeot, Talbot and Cit-

M Parayre was angered by French newspaper reports yester-day suggesting that he was about to resign and make way for the appointment of M Calvet to head the

ever, found it difficult to work with M Calvet, who was brought into the group in 1982 and has increasingly hadowed M Parayre. M Parayre has therefore decided

the division of power increasingly strained relations between two men

of different temperament and style. M Parayre, 47, has been one of the main architects of Peugeot's expansion as a volume car producer through the acquisition first of Citroen and then of Chrysler's European operations, subsequently renamed Talbot

He has inevitably carried the blame for the difficulties of digesting Chrysler's European operations financial problems. The group lost FFr 2.59bn (\$294m) last year and FFr 3.79bn the year before. Its total debts amount to about FFr 45bn. However, M Parayre also

launched the company's recovery programme in 1979, involving more than 50,000 layoffs between 1979 and 1982 and the rationalisation and streamlining of the group's industrial operations. He is also credited with the success of the Peugeot 205 supermini model and the Citro-

running of the company with M Pa- the group as a whole.

rayre.

The former banker – a forceful Ford and Jaguar expand, Page 12

simmering for several months as personality renowned for his strong temper - has been at the centre of the group's latest effort to cut fur-ther its French workforce. M Calvet, 52, has led negotiations with unions for the large job reductions at Talbot and Citroen

Although the Talbot layoffs led to a serious labour conflict, M Calvet successfully negotiated with the Government nearly 2,000 redundancies at Citroën. However, those redundancies are expected to become and Peugeot's subsequent serious a test case both for the pro-com munist CGT union and the socialist Government. The CGT has called workers to reject these redundancy plans when the Citroën factories re open this week after the summe

The Government, the car compe ny and the unions all want to avoid a repeat of the Talbot dispute, which led to violent clashes at the Talbot plant of Poissy near Paris at the beginning of this year.

Peugeot, which managed to reduce considerably its losses in the However, since he was brought in first half of this year compared with three years ago to help Peugeot to the same period last year, has arput itself into order financially. M Calvet has rapidly risen to a posicies were crucial for the financial tion where he virtually shares the recovery of its Citroen branch and

More UK ports defy national strike call

BY OUR LABOUR STAFF IN LONDON

THE CHANCE of Britain's second The chart shows the two constraints national dock strike of the simmer on European Monetary System ex-change rates. The upper grid, based on the weakest currency in the sys-tem, defines the cross rates from voted to defy the strike called by which no currency (except the lira) the Transport and General Workers are than 2% ver cent. Union (TGWU). The lower chart gives each curren

Failure by the union would leave the National Union of Mineworkers cy's divergence from its "central rate" against the European Curren-(NUM) looking increasingly isolatcy Unit (ECU), itself a basket of Eued in its dispute with the National Coal Board (NCB) and the Govern-WALL STREET: The Dow Jones in dustrial average closed down 8.61 at

The transport union called the strike on Friday after British Steel started to unload a coal ship, the Ostia, at Hunterston, west Scotland.

Dockers refused to handle the coal in sympathy with the miners. The union has denied that the strike is political, and said it was called because of British Steel's use of "scab" or strike-breaking labour. Crucial mass meetings will be held at several ports today. The strike is solid at all Scotland's 12 ports which use registered dockers, and at Liverpool, Fleetwood, Hull and Tilbury. Men at two ports -

working. Mr Sam McVeigh, Northern Ire-

land union docks official, said his members felt that the strike was "not so much about protecting dockers' jobs as about supporting the miners." Another factor was that it was only six weeks since the last strike (which lasted 11 days) over the use of non-registered dock labour by British Steel Container traffic will flow freely

to the European continent if - as seems likely - most of the roll-on, roll-off ferry ports such as Dover, Folkestone, Portsmouth and Felixstowe stay open. Dover will not hold a mass meeting until Friday.
The TGWU plans to picket working ports, possibly with the support of miners. The pickets may be thin-

ly spread if more docks reject the

Employers believe that at today's meetings there is an even chance leaders of the Trades Union Comturning into a fiasco was in the bal- that dockers at Southampton and gress (TUC) and the NUM which ance last night after two more ports Bristol - important ports in the na- would seek to avert a damaging tional dock labour scheme – will reject a strike. Another scheme port, Thousands of demonstrators are

expected at the congress, in Brighton on the south coast of England.
A meeting before the congress between the TUC and NUM is still possible, although the miners' union has not agreed to a request from the TUC to bring forward a meeting of the union's national ex ecutive planned for Thursday.

Mr Peter Heathfield, general sec retary of the NUM, will speak to Mr Len Murray, TUC general secre-tary, this afternoon after consulting members of the miners' executive.

There is no hint as to whether the NUM is prepared to compromise on its insistence on increased financial and physical support being given to it by other unions without strings. Mr Arthur Scargill, the miners' president, said at the weekend that it would be a betrayal if the TUC

Grimsby and Immingham on Hum-berside – voted on Sunday to con- In th In the miners' dispute, now in its gave less than financial support. 25th week, efforts are under way to Industry braces itself, Page 5

BY DOMINIC LAWSON IN LONDON

considering selling stakes in the ject. Balmoral field, the North Sea's Ho

It now appears that Sun Oil has written to a senior Department of Energy official saying that it is considering reducing its controlling 58 per cent stake to as low as 30 per

the idea behind such a disposal would fit in with Sun Oil's general strategy of not having much more than a third of any oilfield venture

AT LEAST four oil companies are by disenchantment with the pro- tense scrutiny from the Depart-

North Sea stakes may be sold

However, it appears that two othmost controversial development er oil companies, Atlantic Richfield project. er oil companies, Atlantic Richfield of the U.S., and Britoil, are consid-Sun Oil, the Dallas-based U.S. ering selling their entire interests company, has been engaged in a in the field. Arco has a 3.5 per cent battle with the UK Department of stake, while Britoil holds 4 per cent. Energy over its decision earlier this year to award an order for the field's cevelopment has involved field's £110m (5144m) production both companies in devoting a displatform to a Swedish, rather than proportionate amount of time to the a British yard.

project. In the case of Arco, the disposal will leave it without any North Sea oil development.

The Department of Energy's objections to Sun Oil placing the platform order in Sweden are based on its belief that it will be impossible Mr Ed Moneypenny, a vice-president of Sun Oil claimed that "gentlemen's agreement" to base at of the Balmoral development in the

outside the U.S. He denied that the key contract to the Swedes, the such a disposal would be motivated development has been under in-

ment of Energy's watchdog, the Offshore Suppliers Office. Britoil's interest in selling is also

thought to rest on a more pessimis-tic assessment of the field's reserves than that held by the operator, Sun Oil. Another UK oil company, Carless Capel & Leonard is also considering selling its 1.25 per cent stake in the field.

Although the project is unlikely to be very profitable, buyers are likely to be attracted by the possibility of using the development costs as a shelter for tax incurred on oil production elsewhere in the North

Deminex acquired a 13.5 per cent stake in the field last month as part least 70 per cent of the £435m value of its acquisition of another German company, North Sea Exploitation and Research. Deminex is thus Since Sun Oil's decision to award mooted as a possible buyer of the unwanted stakes.

Thai refinery to expand, Page 12

IMF head warns of disorder amid debt growth

By Reginald Dale, U.S. Editor, in Washington

MR JACQUES de Larosiere ma naging director of the International Monetary Fund, issued a warning vesterday that the unprecedente explosion" of public debt could lead to worldwide economic and finan-

cial disorder.

The cumulative growth of public lebt since the 1970s, if not checked, could have far-reaching conse quences on the very fabric of our society," he told the congress of the International Institute of Public Finance in Innsbruck. Government could no longer avoid "difficult choices on action to cope with the

problem," he said. Mr de Larosiere called for a "consensus" to halt the exploding, mostly domestic, public debt of the Western industrial countries. In the seven largest industrial countries, be said, the ratio of public debt to gross national product (GNP) had risen from an unweighted average of 22 per cent in 1974 to 41 per cent last year.

"In my judgment, that growth is unsustainable over the long run," Mr de Larosiere said. "Thus, either it is stopped by co-ordinated and rational policies or it will be stopped as in the past, by a new burst of in-flation with all the social, political and economic disarray that accompanies it. What is at stake here is nonetary stability, and the sound ness of institutions."

Mr de Larosiere said that to the extent that interest payments were growing as a proportion of GNP, other spending must be reduced or taxes increased by the same amount to keep the deficits growing. The larger the increase in ining. The larger the increase in un-terest payments, the larger must be the spending cuts or tax increases. Because it could soon become "politically difficult" for government to take such steps, it was imperative that countries did not wait to take the required corrective poli-cy decision. "The longer they wait, the more serious the disease become and, while the medicine needed at this time may appear unpalatable, it will surely be much

more so as time passes," he said. No expenditure should be seen as "untouchable" including social and elfare payments, Mr de Larosiere

On the revenue side, increases had to come "through the utilisation of realistic prices, for public services as well as through reforms of tax systems." No group must be "automatically insulated."

World economic woes, Page 10; Mexican debt talks, Page 12

Unitary tax move resisted in California

BY LOUISE KEHOE IN SAN FRANCISCO

unfairly benefit their foreign competitors.

conductor. Intel and several other Silicon Valley electronics manufacturers. They have long campaigned against the unitary tax laws under which companies are assessed for tax on their worldwide income.

Under the pending legislation due this week, all multinational corporations will have the option to continue to be assessed on their worldwide income or to change to ssment of their U.S. income. Which choice a company makes will depend on how it is organised, where it does business and where its profit centres are.

The U.S.-based multinationals that now oppose the tax reforms have calculated that the unitary tax priority," he said. method will remain the best option for them, but that their foreign competitors will be able to cut their tax liability by switching to the secaction fac

The chief complaint of the U.S.based multinationals is that their foreign dividends, but not those of the foreign companies, would con-tinue to be taxed in California. deputy director of the California de-partment of finance in Sacramento. Another problem for many U.S. electronics and computer compa-

nies is that they have extensive op-

NINETY U.S. multinationals with erations overseas in countries that operations in California have decided to change their stance on the in particular Singapore and Malayreform of unitary taxation in the state. They say that Bills coming erations would be treated as U.S. inbefore the state Assembly would ment under the proposed legisla-

"This Bill seems grossly unfair," Hewlett-Packard, National Semi- Dr Gordon Moore, chairman of Intel, said. He estimates that the proposed revisions would give foreign multinationals operating in California a \$250m tax break. "That would put us at a severe competitive disdvantage," he said.

IBM, which has fought vociferously against unitary taxation in Florida and threatened to scrap plans for expansion in the state unless unitary tux laws were repealed, has also switched its position in California.

Mr John Mercer, tax specialist at National Semiconductor, says that the companies will mount a strong lobbying effort against the reform.
"Killing this Bill is our number one

The companies have had little luck in persuading the legislators to amend the laws. "If they can bring me documentary evidence of how their competitive position will be affected, I would be glad to put it before the Governor, but so far they have not," Ms Nancy Ordway, chief

Continued on Page 12

Electrolux to press for Zanussi accord

BY KEVIN DONE, NORDIC CORRESPONDENT. IN STOCKHOLM

deadlock in its bid to take over the concerned. financially crippled Italian home appliances manufacturer.

Mr Hans Werthen, chairman of Mr Lennart Ribohn, Electrolux Electrolux, said yesterday that he finance director, who will meet the hoped a compromise would be foreign banks on Friday, said the

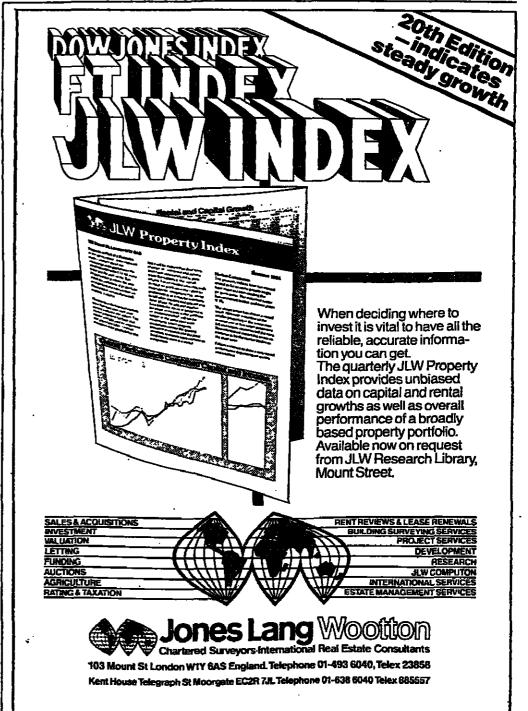
bank creditors. He spent yesterday at the Pordenone headquarters of Zanussi in

ELECTROLUX, the Swedish elec- North-eastern Italy, and after meettrical group, is to meet the foreign ing regional politicians said that a bank creditors of Zanussi in Lon-meeting would be held tomorrow in don on Friday to try to break the Rome of all the Italian parties

A key element in the rescue is that Zanussi's foreign bank credi-The refusal of Zanussi's 24 for- tors should accept a s eign bank creditors to go along with write-down on the \$50m to \$65m of the terms of the rescue package their outstanding loans. The banks agreed with other major parties recently turned down Zanussi's after nine months of negotiations is original proposal that they should still threatening to jeopardise the take a 70 per cent lump sum in pay-

reached with Zanussi's foreign company would "come up with alternatives, but in principle these

Continued on Page 12



- CONTENTS

Sri Lanka: tourism down but World economy: perhaps the Technology: investment in Politics: for Republican tools for future chips..... 9 read Tory...... 10 Management: how redun- Lex: the clock stops on dant executives can help .. 6 deregulation 12

Commodities 29 - London 24-25
Construction 21 Technology 9
Construction 21 Unit Trusts 22-23
Correction 28 Weather 12 Sri Lanka; exams 10 Survey Section III

French borrowing exceeds **forecasts**

By David Housego in Paris FRENCH borrowing abroad this year is running at a considerably faster rate than the government had originally

On unofficial estimates French institutions have already raised this year close to \$5bn (£6.2bn) or roughly the equalitation the Fin Ministry's target for the whole of this year.

The accelerated borrowing reflects the slower-than-expected improvement in France's trade deficit as well as a move by French institutions to take advantage of favourable market conditions to refinance existing debt on cheaper terms.

Foreign bankers said yesterday they expected that the higher level of borrowing would continue as French institutions sought to refinance existing high cost debt.

The slightly lower rates now available to French borrowers are the result of easier conditions in the float-ing rate market and of confidence abroad that the government is determined to stabilise France's foreign

Figures released recently by the Finance Ministry showed that France's outstanding foreign debt (fresh borrowings less repayments) had risen by only \$1.9bn in the first half of the year to

According to the Organisation of Economic Co-operation and Development, France raised \$4.85n on the international markets in the first six months of the year. In the last two months, an estimated additional \$3bu of new loans has been con-

tracted. In the initial estimates by the Finance Ministry, France was expected to borrow some FFr 67bn in "authorised" fresh loans this year compared with FFr 111bn last

These estimates were based on the trade deficit being reduced to FFr 25bn by the end of the year and on the current account deficit being

The trade deficit for the first seven months, however, has risen to FFr 23bn, while the current account deficit for the first six months stood at

Boost for Bonn chemical industry

BY JONATHAN CARR IN BONN

THE West German chemical other things, demand for paints industry expects to boost products for the duction by 5 per cent in real vehicle industry and for offset terms this year after a first half plates for printers.

performance which was still Chemicals sales revenue in

rose in January June by 7 per cent against the same period of last year, and would have been per cent higher but for the

The stoppages affected, among first time.

could cause cancer.

Spanish talks

pact resume

By David White in Madrid

SPAIN'S Socialist Government and the Socialist-led UGT trade

and the Socialist-let OG1 trade union, are trying to restore momentum to talks on a wide-ranging two-year labour pact after a display of reticence by

Discussions with the main

union and employer organisa-

tions resumed yesterday after an interval of more than three

weeks. No concrete progress was made in the early rounds of talks.

The Government, represented at yesterday's talks by Sr Joaquin Almunia, Labour Minister, is anxious to put an agreement together by the end of next month before it sends its dest 109% budget to

its draft 1985 budget

on labour

the other partners.

THE WEST GERMAN Government is prepar-

ing tougher regulations — some to be ready by the end of the year — governing the use of formaldhebyde, the chemical which has caused a major public dispute here.

Dr Heiner Geissler, the Health Minister, said the rules would be introduced irrespec-

tive of the result of an expert report he expected in October on whether formaldehyde

chemical, widely used as a preservative and disinfectant, was already governmed by many rules and recommendations because of its

would put before the Bundesrat (the upper house of parliament) tighter regulations to help ensure thatan excessive indoor conceu-

Dr Geissier noted yesterday that the

By the end of the year the Government

performance which was still strong despite the strikes in the metalworking and printing sectors.

The Chemical Industry Association (VCI) said production race in January-June by 7 per the first haif surged by 14.4 per the strates of 20.5 argely to an increase of 20.5 per cent to DM 31.4bn in foreign turnover. Despite the impact of the strikes, domestic sales were the association said. up by 10 per cent to DM 40bn. Exports rose by 21.5 per cent to DM 36.1bn, thus carrying the export share of overall sales to

Formaldehyde curbs planned

The strength of the dollar same period last year.

was one factor helping the West German companies boost to invest DM 7bn this year — their foreign sales, but exports to EEC states—especially enlargement of capacity than ment of plant and machinery. Another DM 7bn would be spent

because of a better use of capa-city and despite higher labour, A total of 547,000 people were the association said.

Last week the "big three"

chemical companies — Hoechst,
Bayer and BASF — announced
first-half group pre-tax profits
roughly double the level of the more than 50 per cent for the

tration of formaldehyde in the air could not

build up.

Later, tougher measures governing use of the chemicals in hospitals and at work places were also forseen.

Dr Geissler rejected charges made last

week in some newspapers and by the Greens, the environmentalists' party, that he had covered up evidence proving formaldehyde

covered up evidence proving formaldehyde could cause cancer.

The ministers said several groups of federal experts had presented preliminary reports which came to different conclusions about formaldehyde as a possible cancer agent. He had therefore instructed the experts to produce a joint report by October.

Dr Geissler said he would act quickly on the basis of the report and stressed that the Government put health protection before economic interests.

64 Portuguese companies

BANKRUPTCY may be the large textile firms, small ship-only way out for 64 Portuguese ping companies and service companies in such dire finan-companies. They have piled up

companies in such dire financial straits that their workers have not been paid for months.

The companies, led by Lisnave ship repair yards, CIFA, an artificial fibre plant in Oporto, and CIVE, glassmakers in Leiria, have been council the ward was once the ward was once the proper to the ward was once the part of the ward was once the ward was once the part of the ward was once the ward was once the council the companies. They have piled up companies. They have piled up was once the companies of the companies. They have piled up was once the companies of the companies

fund obligations.

The 64, the report says, are potentially unviable. Propping that the Government of Prime Mario Sources is reductionally unviable.

them up with emergency funds for salary payments or repeatedly backing emergency anxious to concentrate its loans to keep them affoat is no longer a solution. The report with better futures.

may face bankruptcy

have not been paid for motions.

The companies, led by
Lisnave ship repair yards,
CIFA, an artificial fibre plant
in Oporto, and CIVE, glassmakers in Leiria, have been
singled out in a government
report on 350 companies which

have piled up debts in unpaid

salaries, social security contri-butions and unemployment

rejects charges

employed in the industry in the first half - 0.3 per cent fewer than in the same period of last year. However, the chemical companies have taken about 2,500 extra workers since

on rationalisation and replace-

West German deficit narrows

West Germany's current ac count was only narrowly in deficit last month, thanks to a big surplus on visible trade caused by a surge in exports, writes Jonathan Carr.

The federal statistical office said the current account—the said the current account—the sum of visible trade, services and transfer payments—was just DM 200m (573m) in the red, after a deficit of DM 3.2bn in June and one of DM 3.3bn in July, last year.

Exports increased sharply from DM 35.4bn in June to DM 39.45bn in July.

Despite the improved July figures the cumulative performance so far this year is down on the results of last year.

Pipe corrosion may force

By David Brown in Stockholm PIPE CORROSION in all three steam generators of Sweden's large Ringhals 2 nuclear reactor is nearing an un-acceptable level and is likely to cause authorities to close the unit and order replacement

A decision is likely to come

of three pressurised water reactors in Sweden, all of which were delivered by West-inghouse of the U.S.

design flaws at a cost of some SKr 200m. Each generators contains about 3,000 pipes. Nearly 10 per cent are damaged—the

reactor closure

within a year, according to the state power board Vattenfall.

before the end of the year, and the cost could reach the original SKr 1bn (£92m) purchase price. This summer, Vattenfall applied a protective coating to the steam pipes in an effort to slow the damage.

The 10-year-old unit is one

Similar problems have plagued Westinghouse reactors delivered in West Germany and the U.S., Vattenfall said. Last year the board was forced to rebuild the steam generators in the Ranghals 3 and 4 units because of other

maximum allowed by Swedish nuclear regulatory agency guidelines.

W. Germany by Pravda

The West German Government yesterday dismissed as "fantasy" charges by the Soviet newspaper Pravda that Bonn was carrying out an economic annexation of Austria, Reuter reports. Yesterday's edition of the

Communist party daily claimed West German businesses were swamping Austria with exports and in-Austral with exports and my bitrating its entire economy by taking over hundreds of local companies.

This amounted to a "quiet economic anschluss" (annexations)

tion), it said, in reference to Hitler's occupation of Austria in 1932

U.S. productivity up Productivity by non-farm private U.S. business jumped at an annual rate of 4.7 per at an annual rate of 4.7 per cent during the second quarter, the Labor Department said yesterday, AP reports from Washington.

This was the eighth straight quarterly increase marking the longest string of gains in more than a decade, the department added.

Dutch budget

The Dutch 1985 budget pre-poses savings of more than Fl 10bn (£2.3bn) but also pro-vides relief ror industry worth FI 1.5bu (£357m) officials said yesterday, Reuter reports from Amsterdam.

The budget, finalised by the Cabinet on Friday, is not due to be announced until Sept-ember 18.

Mr Ruud Lubbers, the Prime Minister, said, however, that a planned cut in corporation tax from 43 per cent to 41.5 per cent or below was not included in the budget.

Afghan negotiations UN-sponsored talks aimed ultimately at the withdrawal of Soviet troops from Afghani-stan moved into a new phase stan moved into a new phase yesterday when the UN negotiator, Sr Diego Cordovez, began talks with both the Afghan and Pakistani Foreign Ministers, Renter reports from Geneva. So far, the contents of the talks remain

China jails radicals Eighteen members of an underground organisation opposed to the pragmatic policies of China's leader... Deng Xiaoping have been jailed in the central province of Henan, Henan radio said, Renter reports from Peking. The group were described as supporters of the disgraced "Gang of Four"

Sikhs arrested NEARLY 60 Sikhs have been arrested in Punjah State since the hijack last week of an Indian airliner by Sikh extremists, according to the Press Trust of India, Reuter

reports from New Delhi.

Greek-owned tanker hit by missile off coast of Qatar

of two previous strikes by Iran this month, and marks the third attack in five days by Iran or Iraq in the continuing Gulf conflict

Local shipping officials are apprehensive that the increas-

apprehensive that the increasing frequency of the air raids
could generate a reaction from
Lloyd's of London concerning
war-risk insurance.
The Cleo I was on her way
from South America to Ras
Tannoura oil terminal in Saudi
Arabia, For her owners, the
Troodos shipping company in
Piraeus, it was the second ship Troodos shipping company
Piracus, it was the second ship
in a week to become the target
Iran is insisting on selling its
oil at the official price—hence

of an attack oil at the official
Lest Friday, the 53,060 dwt the fall in sales.

A GREEK-OWNED tanker, the Amethyst, owned by the same 35,730 dwt Cleo I, was hit by a company, was attacked by missile fired by an unidentified aircraft, thought to be Iranian, off the coast of Qatar yesterday.

The area has been the scene of two previous strikes by

Banl

The Cleo I was said yesterday to have brought the fire on board under control; and was making for Doha, using emer-gency steering. A U.S. warship was on hand to provide assis-

Oil traders in the Gulf believe that the Iraqi strategy of hitting Iran-bound shipping is succeeding in depressing Iranian oil exports. Exports are now thought to be only 12m barrels a day and buyers are pressing for larger discounts.

Peres meets Shamir in new bid for coalition

BY DAVID LENNON IN TEL AVIV

on Sunday of his mandate to form a Government, began his second round of attempts to form a coalition by meeting Mr Yitzhak Shamir, the outgoing Prime Minister, last night.

President Chaim Herzog gave the Labour Party leader an additional three weeks, mainly because of the alliance which Mr Peres had been able to form with Mr Ezer Weizman's three-

with Mr Ezer Weizman's three on the question of rotation of seat Yahad Party last week.
Yahad's move into the folios which Labour would give Labour camp has made it virtually impossible for Mr issues still outstanding are the Shamir's Likud bloc to form a new Government, even with the on the West Bank and peace

MR SHIMON PERES, Israel's the right-wing and religious Prime Minister-designate, who parties, was granted a 21-day extension

Because the outcome of last month's general election made it difficult for either of the big parties to form a narrow coalition, Labour and Likud have been negotiating for the past three weeks on setting up a broad-based Government of a broad-based Government of national unity.

The Peres-Shamir meeting is thought to have concentrated support of its natural allies in overtures to Jordan.

Violence flares in Beirut

A GUN-BATULE involving Lebanese Army soldiers in Druze officer, who was killed Beirut and a deepening crisis between President Amin Gemayel and Mr Walld Jumblatt, the Druze leader and Minister, have raised concern about the fate of the Government and the truce in the capital, Nora Boustany reports.

Four soldiers and one civilian were wounded in a four-hour shoot-out on Sunday in the centrel same communique said the crash was due to foggy centre of Beirut between army said the crash was due to foggy regulars and Moslem gunmen weather. the first such violation of a

coincided with a sharp attack by Mr Jumblatt against the

The Druze leader made his remarks during a funeral MASIER send address ceremony for Maj-Gen Nadim New York NY 10022.



This advertisement appears as a matter of record only

New Issue August 27, 1984

people. Fart private, part stateowned, the yard was once
Portugal's export-earning showcase. But in recent years it
has been plagued by the international shipping crisis and constant industrial unrest.

It has long been annarent

The problem of persistently unpaid wages has affected Portuguese families in indus-



parliament

Dresdner Finance B.V.

Sr Marcelino Camacho, the Workers' Commission leader, has described prospects for agreement as "very difficult" says that bankruptcy should be The prolumently considered. unpaid with the crippled companies also Portuguese include several medium and trial areas.

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International

Yamaichi International (Europe)

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DG Bank Deutsche Genossenschaftsbank Österreichische Länderbank

Union Bank of Switzerland (Securities)

kud in

[jbv::-3]

1000 AND 1000

OVERSEAS NEWS

Bankers worried by Manila-IMF debt pact delay

bankers say the two sides are at last talking the same language. But the gap remains wide, with Manila hesitating in particular over a flotation of the peso; which has already been

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levalued three times since June last year.

The Government is also facing severe difficulty meeting
IMF targets for the reduction of the money supply, especially after a recent costly rescue of a major bank.

Agreement with the IMF is the key to a vital debt rescue package with commercial bank and official creditors, involving \$3.3bn (£2.5bn) of a new money conventional economic solutions

ing a severe contraction in gross a recent University of the domestic product, estimated at 6 per cent in real terms. The annual inflation rate has risen government, towards less centralized notifical and economic

PROTRACTED negotiations between the Philippines Government and International Monetary Fund on an SDR 615m (2478m) standby credit have reached a critical phase, as pessinism deepens over the fountry's long-term expression.

pessimism deepens over the further action, perhaps trigger-ing a default.

A local official says there is only a 50-50 chance of a deal before the IMF's annual meeting in late September. Failure to meet that goal would postion of or almost a year, remained on course, and he voiced optimism about a deal. Western benkers say the two sides are at of 1985. money before the first quarter of 1985. That means a major readjust-

stantial portion of the country's \$25.60n external debts.

Even with a deal, the Philippines is not expected to recover its pre-crisis economic' position before 1980. It is the only country in the region experiencing a severe contraction in gross a recent University of the Philippines analysis argues that

Western bankers are worrled than an IMF agreement will not be concluded before the Philiptralised political and economic

Gandhi in drive to avoid clash over Rama Rao sacking

MRS INDIRA Gandhi's ruling Rao, the new Chief Minister.
Congress-I Party in India has launched a campaign to cationed he had a majority extricate itself from a serious constitutional row over the dismissal of the former film star, Mr Rama Rao's party of "taking missal of the former film star, Mr N. T. Rama Rao, from the job of Chief Minister to the hegislature to the neighbour of the legislature to the neighbour of State of Andhra Pradesh.

Two of the state's Congress I cadership as hostage" Is members of the legislature to the neighbour of the state's could prove a leadership tends to stress that the leaders in Andhra, and not Mrs Gandhi or her national advisers, were responsible two weeks ago for the state's Congress I cadership tends to Sharma, another senior and the legislature to the neighbour of the state's Congress I cadership of Mrs Gandhi or handlers, as hostage" Is members of the legislature to the neighbour of the state legislature to the neighbour of the state's Congress I group in the state legislature.

Two of the state's Congress I cadership of Mrs Gandhi or handlers and not Mrs Gandhi or her national advisers, were responsible two weeks ago for restigned and Mrs Gandhi or handlers as hostage" Is members of the legislature to the neighbour of the state legislature to the neighbour of the special transport from within the state legislature.

Two of the state's Congress I group in the state legislature, resigned on Sunday. He said he "took full responsibility" for pledging his party's support for Mrs Rama Rao's mekend by Mr Rama Rao's mekend by Mr Rama Rao's mekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma, another senior the weekend by Mr S. D. Sharma

Ethnic violence causes sharp fall in Sri Lanka tourist revenues

SRI LANKA'S major tourist not gone shead with investment industry has suffered beavily plans drawn up last year.

But the immediate economic this year as a result of the impact of the troubles has been the impact of the troubles has been the investment that the impact of the troubles has been the impact of the impact of the troubles has been the impact of the impact o

money before the first quarter of 1985.

That means a major readjustment in the rescue package, which originally applied for the 18 mouths to the end of this year as a result of the 18 mouths to the end of this year and the number of tourists year. Mr Fernendez confirmed yesterday that the talks are now forcing on the 18 mouths to the end although nears a rise in the new money required although not in the amount rescheduled.

Some businessmen wonder whether the Philippines Government might outlast the IMF, forcing the Fund to compromise more than it would like. Others say investor confidence may be undersimed by recent wishence by so the first half a bid of the content plant of the control from that a bid only stand.

The force and making large budget cuts.

But the immediate economic budget cuts.

But the immediate conomics of this year, and making large budget cuts.

But devaluation is now be the supply of the troubles has been budget cuts.

But a devaluation is now be the full to the process of over like the present rate of about 25 40 to the internal plant of 18 per cent over the past 12 although near a rise in grounding to specific time.

The number of tourists and roops from the first half of last year and raying in the country force of Sri like the present rate of about 28 for the first half of last year and raying from the manual revenue dropped between about 25 and 20 per cent to five the first half of last year and raying from the manual revenue dropped between about 5 and 18 per cent by the end of this is largely due to the internal time in part of 18 per cent over the past 12 although ne accepts that this is largely due to the internal time in part of 61 per cent over the past 12 although ne accepts that this like present at a rate of about 18 per cent over the past 12 although ne accepts that this little is long to the intensity of 18 per cent of 18 per cent over the past 12 although ne accepts that this little is leaded to the intensity of 18 per cent of 18 per cent over the past 12 although ne ac

Assad 'in bid to abort Libya-Morocco union'

BY RICHARD JOHNS IN TRIPOLI COL MUAMMER GADAFITS
agreement with King Hassan
on a "state of union" between
Libya and Morocco appears to
have badly strained relations
with his one reasonably firm
ally in the Arab world—the
Spran reference of Precident
cally

Syrian régime of President cally. Hafez al-Assad. Meanwhile, as the Libyan Hafez si-Assad.

That is the interpretation placed by diplomastic observers bere on President Assad's the treaty with Morocco, little attention has been paid to President Assad's visit bere.

Bengazi, the main city of eastern Libya, He was reported to have returned at the weekend after talks with President Chadli Rendiedid of Algeria.

Meanwhile, as the Libyan the really mith Morocco, little attention has been paid to President at the weekend after talks with President unsolved problems of the nine-year-old war in the Western

Chadii Bendjedid of Algeria.
Diplomats believe President
Assad may be making a lastditch effort to abort the union which is to be the subject of a Angust \$1 and may be formally declared by Col Gadaffi at the celebrations for the anniversary of the Libyen Revolution here on September 1.

President Assad, it can be ssumed, was angered that Col Gadaffi did not inform or con-sult him before his meeting with King Hassan on August 13 at Oujda, the Moroccan/

Sahara.

In line with its rapproche ment earlier this year with Morocco, Libya withdrew support from the Algerian-backed Polisario Front, which is fight ing the Moroccan army. Col Gadaffi evidently wanted both King Hassan and President Assad to come to the September 1 celebrations.

President Assad, it can be summed, was angered that Col adaffi did not inform or consult him before his meeting ith King Hassan on August 13 to Oujda, the Moroccan/ lagerian border town.

Diplomats point out that September I celebrations.

Clearly, however, neither would be willing to attend in the presence of the other and any increase in Col Gadaffi's influence over the Mahgreb could be at the expense of close ties with Damascus.

Bahrain suffered \$143m

trade deficit last year

BY MARY FRINGS IN BAHRAIN

BY MARY FRINGS IN BAHRAIN
BAHRAIN last year registered
its first trade deficit since 1979,
according to a report just published by the Bahrain Monetary
Agency (BMA).
Although the overall belance
of payments remained positive,
thanks to a surplus on invisibles
of \$266m (£205m), there was a
fall in net official reserves
(BMA and Government) of
\$108m, This brings the estimated reserves to just over
\$1.50m.

deficit in visible trade of

in the value of total non-oil exports, from \$644m to \$612m. At the same time the non-oil import bill increased 8 per cent from \$1.764bn to \$1.91bn

The surplus on services and net capital transfers was \$266m compared with a deficit of \$2.9m the previous year, and the overall balance of payments surplus stood at \$123m, 28 per

A deficit in visible trade of \$1.45m, compared with a surplus in 1982 of \$175m, was attributed parity to a reduction in the oil trade surplus, from \$1.295m to \$1.156m.

The balance in the ron-oil trade account is tradicionally unfavourable, but this was accentuated last year by a fall-off in Bahrain's trans-shipment trade with other Gulf states, which despite a 40 per cent the despite a 40 per cent increase in aluminium exports ited to a 5 per cent reduction

\$2.9m the previous year, and the overall balance of payments surplus is surplus stood at \$123m, 28 per cent down on 1982.

Other highlights from the Surplus in 1982 in 1982 in \$2.9m the previous year, and the overall balance of payments surplus stood at \$123m, 28 per cent down on 1982.

Other highlights from the \$2.9m the previous year, and the overall balance of payments surplus stood at \$123m, 28 per cent down on 1982.

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Other highlights from the \$2.9m the overall balance of payments surplus stood at \$123m, 28 per cent down on 1982.

Namibia talks to resume

TALKS ON the future of government officials say signifi-Namibia (South-West Africa) cant developments on Namibia's South Africa and and the Swape

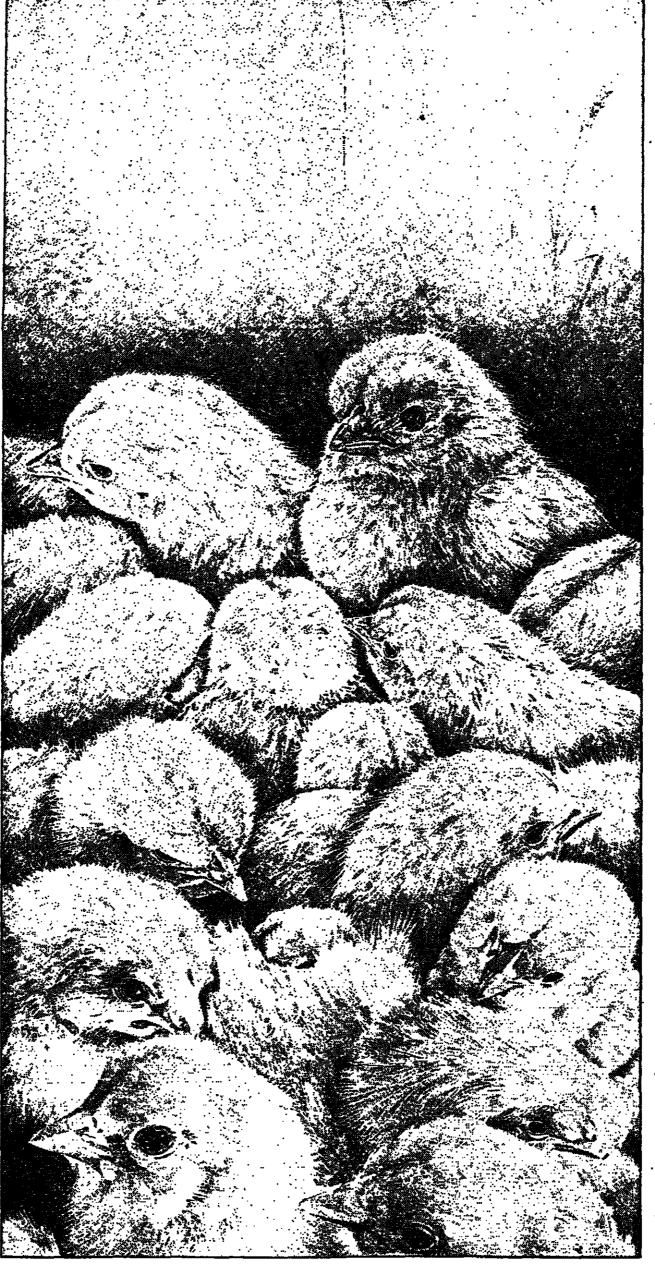
ence movement, are In Pretoria yesterday a spokesman for South Africa's Foreign Affairs Department declined to comment on earlier reports that tripartite talks on Namibia's future are due to resume on Cape Verde Island.

However, he did confirm that today's South Africa chestions by howartiers by howartiers by howartiers. Mr Chester Crocker, the U.S. Assistant Secretary of State for African Affairs, is to visit South

Africa in the next two weeks for talks on Namibia's future. erde talks. South African campaign,

future are likely very soon. Addressing a meeting at Pretoria University on Saturday Mr "Pik" Botha, South African Foreign Minister, said negotiations for a Namibian ceasefire stage." He said he expected the issue to come to a head in

yesterday protested against today's South African Indian elections by boycotting classes. In another development Mr Louis le Grange, South Africa's Minister of Law and Order, said at the weekend that detention Despite the cautious official orders had been served on 17 approach to the muted Cape leaders of the election boycott



BOOKER'S WORL EVEN MORE GROWTH FROM A GROWTH FOOD

BUSINESS As with so many of Booker's companies,

Arbor Acres is first in its field. From its US base, it is the world's leading producer of breeding stock for broiler chickens; about a third of the world's broiler production comes directly from its female parent stock. It has been in the forefront of poultry genetics for over forty years.

Another leader is Nicholas Turkey. Also based in the US, it is the world's principal source of breeding stock for large white turkeys. It has expanding markets in Europe, Latin America and the Far East.

As one of man's healthiest and most efficient sources of protein, poultry is increasingly preferred to red meat in the developed world and has huge potential for growth as consumption rises in the developing world.

Since 1980, profits from Booker's agricultural interests-including agricultural management and consultancy, salmon farming, and arable and forest management-have increased at a compound rate of over 40% annually, and the trend is continuing.

In health foods Booker's world includes Holland & Barrett, the UK's largest health store chain; Allinson, the country's most popular branded brown bread; and leading vitamin brands marketed throughout the US and UK.

In food distribution Booker is the leading cash and carry operator; the largest catering wholesaler; has a nationwide network for delivered trade to independent retailers; and owns the Budgen/Bishop's food store chain.

Booker's world is expanding, at home, in the US and internationally, to the benefit of its shareholders, its customers and the communities in which it operates.

Booker McConnell PLC

LEADERS IN TOMORROW'S WORLD

Half-Year Report:

Copenhagen Handelsbank made an interim profit of Kr. 414,6 million before provisions for bad and doubtful debts, depreciations, adjustments in the market value of the securities portfolio, extraordinary items, and taxes. This compares with a profit of Kr. 219,8 million for the first half of 1983.

PROFIT AND LOSS ACCOUNT (summary)

	Fire	et half of
(Kroner million)	1984	1983
Interest and commission on advances Interest and dividends, etc., on bonds,	1,538.3	1,542.8
shares and mortgages, etc	832,1	494.7
foreign banks, etc	868.9	706.2
Total interest income	3,239.3	2,743.7
Interest on deposits	1,287.2	1,247,9
foreign banks, etc Interest on subordinated loan capital,	879.2	
etc	80.8	88.6
Total Interest expenditure	2,247.2	1,992.4
Net income from interest and commission Profit on and value adjustment of foreign exchange:	992.1	751.3
Profit on and value adjustment of foreign exchange		135.5
own subordinated loan capital + !	_	
Other ordinary income	176.8	161.6
Profit before expenses, etc		
Salaries and pensions, etc Other expenses		

Profit before provisions and

depreciations, etc..... Extraordinary income and expenses

Adjustment for changes in market value

Profit including adjustment for changes in market value of securities, but before provisions and depreciations,

- 423.2

1,196.2

Prospects for 1984 Against the background of the current prospects for the Bank's business volume, the operating results for the full year are expected to be satisfactory - and this despite the heavy competition that reduces the profit margins on many types of

Copenhagen Handelsbank has entered into an agreement Copennagen Hardesspank has entered into an agreement to sell just over halt of its shareholding in Nordfinanz-Bank Zürich. On the assumption that the deal receives official approval, an extraordinary profit in the region of Kr. 90 million will be written into the accounts.

The final results for the year will obviously be affected by the behaviour of bond and share prices.

The fall in bond and share prices in the spring caused a

substantial imputed loss on the securities portiolio for the first half of the year. Even though we expect the share market to be more buoyant in the second half of 1984, the level of interest (and hence the market value of the Bank's bond portfolio) obviously exerci-

ses considerable influence on the final results.

If the average rate of bond interest at the end of 1984 corresponds to the half-year level, a modest loss on the securities

COPENHAGEN HANDELSBANK A/S

China plans to open Tibet route | Malaysian PM

BY K.K. SHARMA IN NEW DELHI

trade. Tibet is a semi-desert, highplateau province of China that has

a long border with India. The suggestion made to the Indian Government is that it should take advantage of the construction

Italy wins

telephone

By Alan Friedman in Milan

ITALTEL, the Italian state-

equipment maker, has won a L50bn (£21m) contract to

network. The network is to be completed

in collaboration with GTE and Telettra and will have capacity for 40,000 telephone lines. The project will also include cable and fibre optic transmission systems and urban telephone networks.

Italtel exports telecommunications equipment at present to Argentina, Brazil, Colombia. Uruguay and Venezuela. This is the first time it has won a Latin American contract to

complete an entire telecom

The Montedison Chemicals group has signed an agree-ment with Asahi Glass of Japan to build a new factory

near Tokyo for the production of fomblin, a chemical used in the manufacture of high technology goods, such as semiconductors.

Under the joint venture Asahi
Glass will spend around \$5m
to build the factory at Chiba,
near Tokyo. The factory will
begin production by the end

munications network.

contract

China is apparently finding it ex- official trade talks this month in then.

Tibet be reopened as a way of signi- the mainland on the overland route, cult terrain.

The overland route to Tibet from India via Kalimpong in West Ben- India is going slow on normalisa-

CHINA HAS proposed to India that pensive to transport the equipment the ancient overland trade route to and other building materials from all two-way trade of \$2bn within five na will start taking applications years from the present paltry from abroad for patents on invenficantly expanding Sino-Indian which goes through extremely diffi- \$145m. A most-favoured-nation tions and industrial designs from trade treaty was also signed.

gal was closed after the brief but tion of economic relations with Chibloody Sino-Indian border war in na because the Government feels 1962. Before then, it had been in virthat priority should be given to setboom in the semi-autonomous retual disuse for several years after
flight to India of Tibet's godnew houses and some small industrial complexes are being contual disuse for several years after
the ment of the contentious border
dispute. The next round of talks on
that is to be held in Peking next
month and it is possible that the India and China held their first trade issue will also be taken up

October 1, six months sooner than planned, the China Daily said yes-

The introduction of a patent system in China has long been awaited by some foreign businesses, which have been reluctant to commit themselves to contracts, especially those involving high-technology items, without protection against

Egypt signs four oil agreements

rock Position recommendation including British Petroleum, areas with planned exploration expenditure of about \$485m.

The largest of the agreements telecommunications supply Guatemala with an electronic digital telephone

SHIPPING REPORT

than war activity, dominated the shipping market last week, as reports of attacks on tankers

in the Gulf abated and labour problems in Britain, the U.S.

and Australia worsened. While Britain concentrated

while Britain concentrated on its own coal and port problems, the threat was building of a rail strike in New South Wales which could affect the chemical in Japan and the Far East.

FOUR FOREIGN oil companies, agreements for 10 concession zone also in the Gulf of Suez.

INDUSTRIAL disputes, rather than war activity, dominated the shipping market last week, last for long. working normally but it was this type of ship continues to the built when 50,000-ton tankers and OBO class tomage

One effect of the UK miners'

strike had been an oil burn by the Central Electricity Generat-

ing Board of about 500,000 tons a week, mostly imported through 50/60,000 deadweight ton vessels from the Caribbean, the Mediterranean or the Continent

yesterday signed exploration and production agreements with the Egyptian General Petroleum Corporation for areas in the Gulf of Suez, the Mediterranean, and the desert Southeast of Cairo.

The agreements are part of an Egyptian drive to boost oil production and maintain a surplus for export in the face of rising domestic demand. Egypt's present production is 750,000 barrels a day, one third of which is exported.

The four foreign oil companies, Esso, Conoco, Getty and Egypt has now signed this year

The largest of the agreements this year, as part of its drive at least to maintain oil production at present levels. Under the terms of various agreements signed yesterday the Egyptian concession at least to maintain oil production at present levels. Under the terms of various agreements signed yesterday the Egyptian concession at least to maintain oil production to at least to maintain oil production of the terms of various agreements signed yesterday the Egyptian concession at least to maintain oil production with the terms of various agreements signed yesterday the Egyptian concession at least to maintain oil production determined to maintain oil production determined to maintain oil production determined to spend a a 317,000 sq km concession south-east of Cario.

BP Development, Egypt production in a 1,200 sq km concession south-east of Sinai. Concoc's the coast of Sinai. Concoc's the coast of Sinai. Concoc's Egyptian subsidiary will spend \$20m on exploration in a 1,200 sq km concession sthis year, as part of its drive at least to maintain oil production will erms of various agreements signed yesterday, the Egyptian General Petroleum Corporation in a 1,200 sq km concession south-east of Sinai Egypt production in a 1,200 sq km concession at least to maintain oil production will read the terms of various agreements signed yesterday the terms of various agreements signed yesterday the terms of various at least to maintain oil production will read the terms of various at least to maintain oil production will read th

Egypt plans to sign another three oil and gas concessisons this year, as part of its drive at least to maintain oil production at present levels. Under the terms of various agreements signed yesterday, the Egyptian General Petroleum Corporation's share of oil production will range between 85 and 88 per cent.

500,000 barrels of crude

(approximately 65,000 tons)."

These vessels were rarely able to trade in crude oil movements, especially from the

Tanker rates improved in

North Sea.

on the Mediterranean last week.
In spite of this extra activity, giving owners a slightly higher

Concern over industrial disputes

warns Japan on 'colonialist' policy indus o co

vorth

Beengereins

imilaria

Been to the grant

Burn ber bei mitte

BY WONG SULONG IN KUALA LUMPUR

three-year-old honeymoon with Japan is over was provided yesterday by Dr Mahathir Mohamad, the Prime Minister, and architech of the country's "Look East" policy of unabashed emulation of Japan.

"Look East" policy of the abashed emulation of Japan.

Dr Mahathir criticised the present bilateral economic ties, saying the situation in many respects conformed to the "classic pattern of economic colonialism." Japan, he said, bought only primary raw materials from Malaysia and "practically nothing" by way of manufactured goods, even-though Malaysia had moved strongly into industrialisation. Speaking to a group of

Speaking to a group of Malaysian and Japanese officials in the capital, he said that although Japan was a strong opponent of protectionism at international forums, the merbational forums, the Japanese market was highly protectionist. He warned that Malaysia could not allow this situation to persist, and might have to retaliate by restricting and buying fewer Japanese goods.

CLEAR evidence that Malaysia's and Japan's refusal to allow

been a critical reassessment of the "Look East" policy by

JAPANESE engineers have resumed work on the heavily-bombed Bandar Rhomeini petrochemical complex in petrochemical complex in southern Iran, Reuter reports from Tokyo. About 200 engineers and other staff have recently entered the \$3.5m complex which was \$5 per cent finished when Iraqi bombing forced work to stop last February.

Malaysia, but observers were surprised to hear Dr Mahathir speak so harshly against the nation he so admired. The speech reflects his growing disenchantment that Japan had benefitted enormously from his policy, without reciprocating.

Malaysian contractors have complained that the Japanese

goods.

He said this retaliatory action could even be extended to cover Asean, the six-nation association of which Malaysia but failed to transfer technology, as promised. Other Malaysian businessmen and countries were equally frustrated with their economic ties with Tokyo.

Dr Mahathir cited other areas of "economic teosion," part, due to the Japanese misincluding the issues of transfer reading. including the issues of transfer reading, or exploiting the pricing, the growing imbalance intentions of the "Look East" in invisibles in Japan's favour, policy.

WORLD ECONOMIC INDICATORS

OREIGN	EXCHANGE	RESERVES

		-		•
	June '84	May '84	April '84	june '83
U.S.	6.329	6,430	€,594	7,850
Japan	27,082	21,750	21,179	20,502
W. Germany	38,766	39,459	40.938	37,692
UK	7.057	7,500	7.317	8,948
Italy	17.920	17,522	17 297	16,963
Netherlands	8.434	8.580	8.705	8,890
Belglum	3,159	3.174	3,445	4.344
begann	May '84	April '84	March '84	May '83
France	19,304	18,935	18,531	14,883

How does Seisella expect to find North Sea oil and gas deposits that have been overlooked delore:

Relentlessly, this special ship plies the North Sea. Near the stern, water guns are triggered to produce environmentally safe underwater explosions. In her wake trails a two-mile-long streamer containing hundreds of sensitive hydrophones. These detect faint acoustic signals that bounce back from deep within the earth.

The vessel is the m.v. Seisella, a survey ship operated by Seismograph Service Ltd., of Kent, England. SSL is a subsidiary of Raytheon's Seismograph Service Corporation.

Seisella's instrument room is the nerve center of this complex data gathering operation. Here millions of bits of data are digitally recorded in preparation for computer processing. In areas of high interest, data can be recorded with such high resolution that three-dimensional maps can be made of the strata beneath the sea.

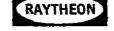
As a result of this improved detail, Seisella can help find commercial deposits of oil and gas

that might have been overlooked. Fewer wells may have to be drilled to delineate a field. And the time between discovery and production may be substantially reduced.

In fact, savings for oil companies can be significant even when no oil is found. If drilling even one dry hole is avoided, the cost of the survey is more than justified.

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lead

tourist

invasion

PROVISIONAL tourist statistics

ear - an increase of 14 per cent

over the same period in 1983. The

biggest increase was a 20 per cent

rise in the number of U.S. visitors,

encouraged by the strength of the

A record 13m visitors to the UK

are expected for the year as a whole. Their spending is estimated to reach £4bn, of which nearly £1bn

By Lisa Wood and

Americans

Industry draws up plans to cope with dock strike

BY OUR INDUSTRIAL STAFF

eric Viscozi 38 184

called last Friday. They drew com-fort, however, from the decisions at partial closedown of ports would be some ports to continue working.

The Association of British Cham-

bers of Commerce said: "This dispute looks as though it will be less the dockers' solidarity would allow a strike-bound dock to a working goods.

The CBI said that if the strike did begin to bite, the first sectors to suffer would be bulk imported raw madamaging than its predecessor terials such as paper, chemicals, The association said the cracks in the dockers' solidarity would allow The effects would then spread to goods for export to be diverted from food, components and finished

The chemical industry is poten-

BRITISH companies spent the dustry (CBI) gave a warning last business goes through the ports. The weakest point is seasonal excontingency plans to deal with the per cent of industry to a standatill effects of the national docks strike within weeks. It remained cautious particularly in key ports such as Southampton and Hull, grain exports might be one of the main ca-

> Officials of the National Farmers Union and the Ministry of Agriculture cautioned yesterday that it was far too early to tell what impact the strike would have on the food trade.

Food stocks in cold stores are plentiful. Many importers are be-The Confederation of British In
The Confederation of British In
The Confederation of British In
The Chemical industry is potentially vulnerable, since over half its stocks in anticipation of the strike. lieved to have built up considerable

> One result of the tourist influx has been that there are only three closed theatres in London this year, compared with about 12 early last year. In the West End, a dozen musicals are playing - as many as the total number of shows on Broad-

will be from Americans.

Musicals are particularly attractive to American visitors and to those tourists who may have language problems with plays," the So-ciety of West End Theatres says. Attendances this month are 12 per cent up on the same time last year. overseas visitors, it must now be in] excess of 45 per cent," the society

London department stores are al so benefiting. Takings at Harrods in Knightsbridge are up by an aver-age of 20 per cent this summer. with Americans buying traditional goods including cashmere knitwear and china, but also "shopping throughout the store," Mr Aleck Craddock, the chairman, says.

The antiques trade has gained too from tourists. Nearly a third of the more than 20,000 visitors to the Fine Art and Antique Fair at Olympia, London, last June were from abroad, particularly from the U.S.

Outside London, traditional tourist attractions such as Windsor Castle, Stonehenge and Stratford-upon-Avon remain as popular as ever but tours to Chester, York and Edinburgh are attracting increasing

Frames National, a coach compa ny, estimates that its sales of tours are 50 per cent up on last year and that its figures are as good as dur ing 1977, the year of the Queen's sil-

Lamb dispute shows lack of EEC rules

BY ANDREW GOWERS

THE LATEST Anglo-French fracas meat. It has also exposed the wide gulf between approaches to the issue in different countries. show that 3.15m people visited Britain in the period March to May this

Community's power over so many aspects of what we eat, it has no common rules on the overall question of unwanted chemicals in food, or how to detect them.

It can ban the use of individual esticides - as it has done with DDT for example - or of growthpromoting bormones in animals, such as those found in large quanti-ties in veal from continental Europe a few years ago. EEC officials are

also reviewing the safety of hor-mones used in beef production. The Commission may recom-mend what it believes to be an acceptable maximum for particular chemicals in food, but its suggestions have no legal force.

In the absence of common regulations, there is the usual spectrum of views on the right way of monitoring and controlling the quantity of unwanted chemicals in food. West Germany is at one end of the scale. with a meticulous sampling system, and the UK is at the other, with a Whereas we would normally ex-pect 30 per cent of sales to be to deep scepticism of legislation on

interested parties should have:

It is into that institutional vacuover the lamb trade has joited ex- um that France has stepped with its perts in London and other EEC cap-itals into taking a new look at the more than one part per million question of chemical residues in (ppm) of Lindane. Any supplier of sheepmeat to France whose consignments repeatedly show higher residue levels than that will find Perhaps surprisingly, given the himself barred from the market.

gamma-HCH, is the active ingre dient of most commonly used dips against sheep scab, a permicious and highly infectious disese caused by mites burrowing under the animal's skin. Given that the latest phase of a

particularly vigorous national cam-paign to eradicate the infection in Britain ended less than three weeks ago, farmers reckon the residues in above the French limit.

As a member of the controversia ochlorine group of pesticides to which DDT also belongs - it is agreed that Lindane is dangerous if ingested in large quantities.

The British Government does not, however, agree with Paris's assertion that the Lindane levels found in UK meat pose a health ha-

The French limit on Lindane is certainly low by international standards. The United Nations' food monitoring body, Codex Alimentarius, recommends a limit of 2 ppm

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Frankfurl om Marn, in August 1984

No. 005031 of 1884

IN THE HIGH COURT OF JUSTICE Chancery Division, in the Matter of BOOKER McCONNELL PLC and in the Matter of the Companies Act 1948. NOTICE IS HEREBY GIVEN that a Petition was on the 7th August 1884 presented to Her Majesty's High Court of Justice for the confirmation of the raduction of the capital of the aboveramed Company from £40,800,000 to £40,000,000 by returning capital which is in excess of the wants of the said Company.

ompany. AND NOTICE IS FURTHER GIVEN that And Notice is former given that the said Petition is directed to be heard before the Monourable Mr Justice Vineloit at the Royal Courts of Justice, Strand, London WC2A 2LL on Wednesday the 5th day of Soptember 1994.

ANY Creditor or Shareholder of the said Company desiring to oppose the making of an Order for the confirmation of the said reduction of capital should appear at the time of hearing in person or by Counsel for that purpose. A copy of the said Petition will be lurnished to any such person requiring the same by the undermentioned Solici-tors on payment of the regulated charge for the same.

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North Sea commitment sought

BY DOMINIC LAWSON

THE DEPARTMENT of Energy's bute in the future. The letter seeks come response to the creation in al oil companies in an unprecedented effort to expand UK involvement in research and development for the offshore oil industry.

The move follows a letter sent to all companies that have indicated their intentions to apply in the forthcoming minth round of UK cil

The letter, sent by Mr John d'Ancona, the director general of the OSO, asks all the recipients to say what they have done for UK research and development in the past and what they propose to contrimove by the OSO as a rather unwelin the UK oil industry.

Energy Minister, had said in May that he would regard a commitment to UK research and development as an important part of the criteria by which he would judge the applicaround. However, it is apparently unprecedented for one of the licensing criteria to be tackled in advance of the formal close of applications. The oil industry has until December 17 to submit its ninth round

North Sea watchdog, the Offshore a reply by the end of September, Supplies Office (OSO), is to hold a series of meetings with internation. Mr Alick Buchanan-Smith, the panies in the UK offshore oil and

gas industry. However, Mr Christopher Ryan, the director of BRIT, denied that the organisation had been consulttions of oil companies in the ninth ed by the OSO over the development The UK Offshore Operators Asso-

ciation said: "The letter will be discussed at our next council meeting." There is considerable anxiety on the part of some foreign oil companies that the move might herald of-The oil industry is viewing the ficial endorsement of protectionism

British spending on ships falls 36%

NDICATORS

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C. C.

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200

Washington Commen

SPENDING ON new and secondhand vessels by the UK shipping industry fell by 36 per cent last year to £250m net of disposals. The deships were delivered.

Public-sector spending on new ships also fell by 36 per cent to £7m, while the private sector cut the bill for alterations by almost 40 per cent

In 1983 the industry received orders for 54 new ships worth £365m, a fall of £160m over the previous year. UK yards built 34 ships. South Korea was the main overall deliveries by value.

The Department of Trade figures, published in the magazine British Business, showed that new orders

which accounted for 14 per cent of corresponds with a world-wide emphasis on that type and size of ves-

placed in 1983 fell by almost 11 per saw a reduction to only seven orcent to 280,600 gross registered tons ders for offshore supply vessels and in 25 vessels, compared with 314,000 tugs. The emphasis has switched to grt in 34 ships in 1982. That reflects more powerful and sophisticated the continuing depression in freight supply ships as drilling moves into markets and the high level of idle deeper and more difficult water.

Only 11 orders were placed in for-eign yards – one more than in 1982 was £28m (1980 prices) compared – and 14 with UK yards (24 in 1982). with a revised estimate of £58m in Seven were for bulk carriers of the first quarter. That reflects prog-25,000 grt from South Korea, which ress payments on vessels delivered.

The fall in North Sea chartering rates, because of an excess of ships,

Investment by the shipping in-

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When redundancy can lead to a new start

term employment growth.
That at any rate was the

theory behind Expand-a-Firm— an imaginative if necessarily small-scale experiment initiated in 1981 by Dr Meredith Belbin of the Cambridge-based Employment Development Unit with modest funding from the Man-Services Commission

(MSC).

Three years later Expandation has not quite run its course but Belbin is nevertheles sufficiently self-confident to be claiming success. In a new booklet which details among other things the results of the scheme so far he maintains that a significant number of new jobs have been created and that the effects "are read and not

Development Fellows (as the redundant managers were somewhat grandly called) were carefully matched with 11 companies, most of them in Wales and the Midlands, between mid-1981 and mid-1983. Under the terms of the programme, they were paid £7,000 for a year but the hope was that the small company would find them so useful in their work they would be offered a full-time job. This had happened in six of the eight cases where managers had been

cases where managers had been taken on more than 12 months before the booklet was written (though one was later dismissed on personal grounds).

Moreover, a total of 59 new jobs were generated following the appointments of the "Fellows" and a further 16 more generated form personal were "saved from certain ex-tinction" in a company sud-denly laid low by the death of its managing director—though Belbin wisely qualifies his find-ings with reference to the argument that sheep firms might have generated jobs anyway even if they had not been

In view of his apparently im-pressive hit rate, it is perhaps a little ironic that the MSC has since set new objectives for its Programme (MEP), by contrast, ment Development Unit, 1 spending and subsequently retries largely on a special MSC Silver Street, Cambridge CB3 fused further financial support training programme which all 9EL. Price £3 post free. It fused further financial support for Expand-a-Firm.

Significantly, however, the

substantial numbers of businesses (750 this year) and run with the co-operation of more than 20 universities, polytechnics, regional management centres and private consultants.

By comparison, Expand-a-Firm the MSC only pays the executive a modest training allowance of the management of the management of the management.

was inevitably seen as somewhat elitist as well as being a test-bed for some of Belbin's earlier research. It was based on his personal hypothesis that the key to regenerating a depressed region "kies in taking the fullest advantage of the under-utilised manpower resources that a region possesses, especially at the top end of the

Selection of candidates

Much, of course, depends in an experiment of this kind on the choice of company and exe-cutive—a point which Belbin was careful to take into needed to create large production units in depressed areas."

Encouraged by his results " and in which the manager foresaw rites and he secured a contract the need for a colleague whose with Cambridgeshire County personal contribution and capa- Council for a new programme

most successful, it was found, contain executives with con-trasting qualities and complementary skills, who have found their true team role and have learned to pull together. Appli-cation of these methods and techniques became an integral part in the selection of suitable business growth, investors will candidates for the development have made a sound investment."

redundant executives attend also includes an assessment of ahead of their secondment (in Create-Your-Own Job, another

TAKE ONE key executive off panies through its nationwide it, "is to supplement their existing dole queue, mix with a small management Extension Profing skills with small business from poised for expansion, and if all goes well you should have a cost-effective recipe for long-turn expansion, and profit in the small business are resources are slender by the result with the result business and the companies with the result business are resources are slender by the result business.

equivalent to the unemployment pay and social security benefits which he or she would other-

which he or she would otherwise have been collecting.

Preliminary research at Durham University Business School suggests that the Management Extension Programme is a cost-effective way of creating jobs and a more detailed report is expected to be published later in the year. The MSC certainly seems to prefer this approach to Expand-a-Firm, though in his booklet, Belbin argues that based on a total expenditure of £57,225 in direct salaries plus national insurance, the cost per job at £719 is certhe cost per job at £719 is cer-tainly low "by comparison with the scale of public empenditure

city for responsibility was capable of enlarging the scope of the company.

The assessment of such individuals was influenced by a study carried out by the landstrial Training Research Unit (ITRU) — a research organization previously run by the issued shares redeemable at organization previously run by the issued shares redeemable at organization previously run by the issue price if employment targets are met or at a specified premium if they are not. Shares not redeemed will be passed to investors in the fund.

"If CEBEE succeeds in its "If CEBEE succeeds in its social and employment sims," explains Belbin, "the local investor has made a worthwhile contribution to a community cause. If it does not succeed in creating jobs . . . but leads instead to high productivity and

of small enterprises. *Countering Unemployment
The Management Extension is available from The Employ-MSC is firmly committed to the this case it can last for enything small scale experiment usined idea of "marrying" redundant between 10 and 26 weeks). The executives with small com-



A mixed experience

TWO YEARS ago Jim Robertson (above), proprietor of North Wales-based Dee Electronics, had just taken an Expand-a-Firm Fellow permanently onto his payroll. Robertson had been delighted with his performance over the previous 12 months and had decided that the skills of this former big company executive were well worth paying for out of the company's own resources.

Unfortunately, however, this honeymoon period did not last and several months later the two men parted company after a clash of ideas.

after a clash of ideas.

Happily, the incident has not hampered Dee's growth for Robertson now employs 32 people (compared with 20 previously), has just taken the next door unit to make room for expansion, and is currently in negotiations with the Welsh Development Agency to build his own purpose-built unit in a year's time. His erstwhile employee, moreover, has also benefited in that he is now self-emin that he is now self-em-

recalls Robertson, "was to take the pressure off me. He gave me greater scope and more time to expand the commore time to expand the com-pany's activities in other directions. We have become more innovative and are help-ing our customers with design and development, as well as with straightforward manufac-

probably have taken on some-body like the Fellow in any case, but admits it is easy to say this with hindsight. Belbin's booklet contains three other case studies of companies where the experi-ment paid higher dividends (the names he uses are fictitious). Metal Turnings, for instance, a company in the labour-intensive business of bending metal tubes, took on an unemployed production engineer to help develon a engineer to help develop a new process for producing aluminium tubes. A second Development Fellow was also hired on the commercial side, five additional employees were taken on, and the com-

were taken on, and the com-pany is considering building another factory.

Canvas Holdings had been trading in tents, blinds and shop awnings for 100 years before misfortune struck with the death of its managing director. A point was reached when the bank decided to call in its loan, but following the appointment of a Developappointment of a Development Fellow to get a grip on the commercial and finan-cial side all 16 jobs were

The inventor/manager of

The inventor/manager of Sensorgram was still in his twenties and worked with his mother in controlling a research-based business with a high-technology product geared to the luxury fashion market in the United States. Other developments, however, were threatened by a depres-sion in this market. Belbin notes that the appointment of a 58-year-old Development reliaw with commercial and technical skills, taken on to expand sales, almost back-fired. So enthusiastic was the fired. So enthusiastic was the owner about his entry it to the company "that he arranged for him to take a flat locally and to receive a thorough grounding in the technical work of the company. A good deal of tact was needed to enable the Develop-

ent Fellow to extricate him-

U.S. antitrust

How not to put a foot wrong

United States is widely agreed process of negotiating licensing ceeding if it subsequently to be a legal minefield for the agreements. ursinitiated. But according to Dr Richard Hass and Lord Lloyd of Kilgerran—two inter-Lioyd of Kilgerran—two inter-national lawyers with wide experience in this field—there is a relatively simple but sur-prisingly little known "clear-ance" procedure which may be particularly helpful to small UK plete copies of all documents firms entering into licensing agreements with U.S. com-

British companies contemplating marketing or manufac-turing agreements will almost turing agreements win amost certainly need to take full legal advice. But the U.S. Department of Justice procedure known as the "business review letter" can assist them to establish whether their proposals will be considered articompetition and the Lagrange of the considered articompetition and the Lagrange of the considered articompetition. will be considered arti-competi-tive under U.S. law. Though the Department of Justice is not authorised to give advisory opinions to privete parties fixelf its Antitrust Division is, in cer-tain circumstances, willing to review the proposed business conduct of companies which

The procedure requires the the public interest, "requesting" parties (that is After considering a requesting UK firm and its U.S. the Department of Justice and detailed statements of all collateral or verbal understandings must accompany the relevant data. Moreover, the Antikrust Division can ask for any additional information and

can undertake an independent investigation if necessary.
Under the rules of the scheme, companies can only rely on a business review letter if signed by the assistant attorney general of the Antitrust Division or his delegate; that letter will not cover any party which does not join in the "request"; it will state only the Department of Justice's intentions under antitrust legislation at the date at is signed; and the Antitrust Division remains

ANTI-TRUST legislation in the have negotiated or are in the free to bring an aution or pro-

the Department of Justice is free either to state its present intention as to enforcement, or decline to make any statement, action it considers appropriate. The nustness regiew request, all the information supplied and the division's reply will subse-quently be indexed and placed on a file available to the public though companies can ask for some or all of the information

some or all of the mornatum to be temporarily withheld.
When these procedures have been carned out the file remains open for a year, after which it is closed and the documents either returned or disposed of at the discretion of the Antitrust Division. Information on how to apply for a "Business review letter" is available from the British Overseas Trade Board, UT2/1B, Rhom 576. 1 Victoria Street, London SWIH OFT. Tel: 01-215

In brief...

QUESTER Capital Management, a company jointly owned by ex-ICFC managers Andrew Holmes and John Spooner, stockbrokers Quilter Goodleon and the National Coal Board Pension Fund, appears to have bucked the Business Expansion Scheme trend. While most BES funds this summer have been struggling to reach their minimum targets, Quester says its new Quadrant Development Capital Fund 1984 has successfully pulled in £2.5m. Not only was this close to best expectations, it makes the fund one of the biggest to be established so far this year.

Quilter Goodison's strong private client base, of course, was a big help and Holmes admits that "in the region of 70 to 80 per cent" of the substitute of th scribers came through this source. It is nevertheless a significant fillip for the BES which, ludging by the previous response to funds, seemed to be getting coldshouldered by investors.
Holmes, who also has plans
to manage venture capital on
behalf of institutions, insists

that he is looking for young growing companies. "Atthough we might do one or two asset-backed deals like hotels litter in the year to get a spread, we will not be run-ning this as a defensive tax shelter."

STEWART Fund Managers, meanwhile, is also pleased at raising just over film from 119 participants for the Stewart Business Expansion Fund 1984-65 which closed last week. Stewart regards the result as "very successful in what has been a difficult period for the launch of new funds for this nature," adding funds for this nature," adding that the amount raised is hig enough to allow a diversified portfolio of investments in the correst tax year.

Many eyes, however, will be focused on the Houre Octagon BES Fund which is due to close at the end of August. Unlike all other BES funds, Hoare Octagon will specialise in one sector (information technology)—so the response to this idea will be closely watched by its competitors.

ONLY A nation which is-vented the "brunch" could also refer to the "branchise."

According to a new layman's A-Z of franchising by John Admes and Kenneth Prichard Jones, this is an American term meaning. "a branch of the franchisor which itself coording in the standard siving operates in the standard style of the franchisee." The English term, the anthors add, is managed outlet. "F is for Franchising," as the booklet is called, is a kind of dictionary for prospective franchisees which, besides explaining special terms, tries to point to some of the prob-lems which may be faced both before and after entering into

Notwithstanding the relalively low risk of fallure (compared with other business activities), the authors warn that franchisers have been misled by unstrupulous salesmen. The book "is intended to help prospective tranchisees ask the right questions and to encourage them to make sufficient investigutions into the franchises on offer."

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NECSTALL. E11-3 500 A A COLD WILL SERVICE

The Edinburgh Festival has never really come to terms with the visual arts, never accepted them fully as a central and necessary element in its make-up. The truth is, this year as always, that there has been no policy other than to expect something to turn up. And, of course, it has: a delicious Lavery exhibition, coming soon to London, at the Fine Art Society; young Scottish Expressionists at the 369 in the High Street; an exquisite show of Steiglitz photographs brought over from America by the Stills Gallery just a little further down the Royal Mile; vigorous new work by the excellent John Bellany at the Mercury Gallery on the Mound; Demarcation at Mound; Demarcation at the Edinburgh College of Art; Judy Chicago's Dinner Party in Britain for the first time at the Victoria Hall; Paoloza at the Academy; Ian Hamilton Finlay at Graeme Murray in Scotland Street; John Cage and Basquiat at the Fruitmarket; Matisse sculpture (also coming on to London) at the City Art Centre; and much else besides, Centre; and much else besides, all of it worth seeing. But Scotland's most important

art event of the year coincides with, rather than belonging to, the Festival—the reopening of the Scottish National Gallery of Nodem Art in its hardsome Modern Art in its handsome, splendidly adapted and ample new home, the former John Watson's School in Belford beyond the Anglican Cathedral at the West End.
Its old home, Inverleith

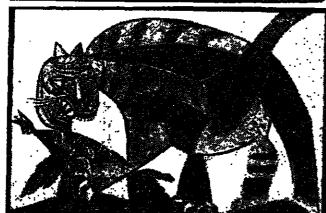
House, high up in the Botanical Gardens, was handsome too, but far too small to hold a major collection of international standing, and for too long able to offer little more than the most frustratingly choice selections from the treats in store, and the smallest of exhibitions.

Altogether it has been an extraordinary yet oddly in-conspicuous story of success, for the Gallery was instituted only in 1960 with a purchase grant of £7,500, which would seem for once to have been more an indication of Scottish optimism than providence. Douglas Hall, its first and only Keeper, has worked miracles in building up so distinguished and special a collection, and the city is considerably in his debt. The signs are, however, that a certain local pride and, perhaps even more, a natural curiosity, have been reactivated by the hullabaloo of these past few weeks, for attendances are now gratifyingly, unprece-dentedly, high.

The opening display is in two large parts, with the 12 galleries on the ground floor given over to the permanent collection. They take us room by room from high cubism to the new figuration, by way of expressionism and constructivism, surrealism and pop art along the way, the British development in counterpoint to the international, and we see some wonderful things: the Traili Bequest Vuillards and the Mait-

Visual feasts of the Festival and beyond





Top, Paolozzi's "One Party in Three Parts" (1952 collage); and Picasso's ' " Cat and Bird " (1939)

Japanese Theatre, a perfect Mondrian, cubist still lives by Picasso and Braque. Epstein's amazing Consummatum Est lies in its special tomb at the corridor's end.

Upstairs the 10 galleries are full of a brave, didactic exhib-tion devised by Hall and his assistant keeper, Keith Hartley, that offers the opening words of Genesis as a clue to the reading and understanding of what the artist takes from the natural world in reference and experi-ence, to be transformed by the raw materials of his own art into its own equivalent reality.

There is some pure abstrac-tion, of course, but most of the work is clearly referential,

the issue being rather to what

simplification, reorganisation, choice. Indeed the point of the exhibition, and its sucess, is to show us repeatedly as we move the Heavens, the Earth, the Seas, Plants, Creatures, Man-

offering of another. It is an intriguing show, full of splendid works, many of them most generous loans for this uncertain age: Barnett Newman, Miro, Klee upon Klee, some wonderfully explosive seas and flowers by Nolde, and the most extraordinary Bequest Vuillards and the Mait-land Matisse, a Bonnard country lane, the great Kirchner art have always involved Dongen bouquet nudes by Spencer and Freud side by side, flatfish by Bellany and Soutine,

a fearsome César scorpion and a predatory Picasso cat.
"Creation" is sponsored by
IBM and remains on show until

So back to the Festival proper and to Demarcations at the Edinburgh College of Art. Richard Demarco, whose creature it is, has been for nearly 20 years a mainspring of the Festival in its visual aspect, often overwound admittedly and sometimes unpredictable in its energies and timing, but wonderfully resilient: now we begin to wonder how long it can keep going. The College is made for the Festival, with its fine runs of gallery and studio, and the perfect place

means a railure, Good galeries have come forward to take the spaces (Bernard Jacobson, the Scottish Gallery, Coracle, Robert Fraser, Gimpel Fils, Blond, Brompton, Murdoch Lothian, Bruton, Canada House, Carten, & College, Lothian, Bruton, Canada House, Garton & Cooke, the Galleria Cavallino from Venice). Between them they have brought along some very goods things—Albert Irvin, William Crozier, Bourdelle, Hodgkin, Brockhurst, June Redfern—and have let no one down. Demarco bimself his own rallery artists himself, his own gallery artists apart, has brought in ANZART, a group show of new Australian and New Zealand art that is as uneven as any group show is likely to be, and as interesting, with god things in it (by Linda Marrinon, Maria Olsen, Lowe, Drummond, Trusttum). It would have done better for itself by a more concentrated hang. Demarco has always stood on the principle that the first duty of the organiser in art is to make things possible, to give artists a chance; it is time the Festival gave proper backing to Richard Demarco.

The Eduardo Paolozzi retro-spective at the Royal Scottish Academy (until September 10)
which the Scottish Sculpture
Trust, soon most unfortunately
to be wound up) has organised

in honour of the artist's 60th birthday (Lufthansa, Pearson and Couran the sponsors).

It does go on to Munich, Cologne and Breda, so I may well have the chance to return to it at least in grift Its title. that for the artist to move away, often far away, from observed reality is not to betray and abuse it, but rather to confirm Recurrent Themes, is explicit enough; and through all the digressions and diversions of a the experience of it in the long career, the love affair at once with junk and the highest technology, Desperate Dan and the Scientific American, we see clearly that the principles of collage — breaking down, re-arranging, reassembling, breaking again — inform everything he has ever done. With an imagination as fertile, and an eye as quick as his, the work can only be rich and strong. WILLIAM PACKER

Achucarro/Elizabeth Hall

David Murray

For his South Bank Summer Music recital on Sunday, the panist Joaquin Achucarro played the complete Goyescus of Granados, preceded by the Bach-Busoni Toccata in C. Not so much a programme as a resounding collision, even with an interval between them; presumably they are works that Mr Achucarro just likes playing. He is a redoubtable performer, draft militaes against that. always incisive (even un-gentle) and of unflagging power. In fact, the uniformity of his style and respects the Goyescas cycle when some considerable way toward concealing the differences between Bach-Busoni Classical Interpretion prize in

survives, and many passages successive numbers in Goyescas sound homeless without it. Achucarro gave it a grand-scale style than by sentiment.

performance, with plenty of impersonal fire and some flinty tone. There was little of the sense of improvisation that belongs to the earlier movements. but Busoni's elaborate piano-

Achuearro obviously knows Bach's Toccata in C, S.564, spires loyalty despite its sors for Scottish arts organisa-a big organ piece, comprising diffuseness and the fact that tions has increased by more Bach's Toccata in t. cause, diffuseness and the fact that a big organ piece, comprising diffuseness and the fact that a Prelude, an Adagio and a every piece in it (except the evergreen "Maiden and the evergreen" "Maiden and the evergreen" "Maiden and the evergreen". Fugue. Busoni's transcription evergreen "Maiden and the is, as usual, in something like Nightingale")is over-long. The

In that respect, Achucarro disappointed. Each piece was delivered with panache, and with the occasional inner voices rubato and lots of nergy. Noth- nerable scale.

sors for Scottish arts organisa-tions has increased by more of sponsors, the overall finanthan 10 per cent in the last year, according to the results of a sponsorship survey for by the loss of funds from

Huxley had been fascinated by the tale of Urbain Grandier. sharply declamatory and busily gestures since if refined, his athletic, and heavy. The organ-character of the music scarcely—and much of a muchness. The doesn't cultivate a pianissimo.

As a sequence, the pieces disthe charismatic cure of Loudon who was burned at the stake in 1684 after being condemned as the instrument by which the closed too little expressive devil had prosecut a grant of the philosophical and intellectual elaborations of Huxley down to the variety (except perhaps to the ear of the faithful), none of the intimate quirks that can add fresh sense to otherwise repetitive writing. It was a curiously bone, contriving a succe of hard, short scenes in which the nature of spiritual and sober performance, despite its force and its dedicated effici brilliantly pointed up; there ency. I think Granados thrives was a modicum of stylish better on a smaller, more vulphysical ecstasy is illuminated

Scottish sponsors increase

The number of business spon- Scottish Arts Council. But in cial support for 1983-84 of £836,579 is £71,075 down on the the idiom of the Brahms "Paga- frail, romantic Granados person of a sponsorship survey for by the loss of funds from him: Variations — by turns ality is genuine, his Spanish recently completed by the two major sponsors of 1982-83.

East Berlin Ballet/Edinburgh Festival

Clement Crisp

When jesters and ideology take over Swan Lake, then the enterprise is doomed. When the staging further proposes Chaikovsky's integral 1877 text (itself an ill-balanced first attempt at a ballet score) and uses this for an action, largely unrelated to the original libretto and wholly re-choreo-graphed, about "a young man who has to be made submissive in order to be integrated into his environment," then it is doubly doomed. In the dismal surroundings of the Edinburgh

by mischance decided to use a perfunctory lake setting by Chaikovsky music, I came to eight of von Rothbart's henchrealise that the mistake not men; the formal lyric tragedy not mine but the Komische devised by Petipa and Ivanov Oper's, and that the grey conwas, of course, nowhere to be crete palace setting filled with found, save in a brief and ingauzy costuming (the women be-bustled like Rod Hull's Emu), with Siegfried, Prince of Denmark, emoting all over the stage while the Princess Mather and von Rothbart impersonated Gertrude and Claudius, and the pas de trois was given over to the jesters' bruitish mining of the play-The Chaikovsky score was un-

exact fragment of the Black Swan pas de deux which came -such being the original structure—in Act 1.

rolled in all its un-pruned luxuriance, with only one interstudio, and the perfect place for the kind of art fair-cumsymposium-cum-rolling exhibition that Demarco has always relished. But such things need money to set up and to pay the rent, and money here has been kept very short.

Demarcation, therefore, is diffuse and disorganised, uneven and unpredictable, but it not uninteresting and by no means a failure. Good galleries have come forward to take the

version of Hamlet which had dressed, who were lugged across dramatic sonority of a dog-food

The choreography is uneventful, unmusical, and the dancers rattle through it in a style more energete than stylish, with rare evidence of any classic finesse in execution or understanding. The performers are clearly dedicated and wholehearted artists, but only two interpretations seemed to me noteworthy. Angela Reinhardt, the Odette of val, and Mr Schilling provided a mammer more gentle and sweet not one passage of dance merit. His creative process is a form of finement, than any other I

London Sinfonietta, Nexus/Albert Hall

Andrew Clements

An exotic confection for are neither intrusive nor of Friday's Prom: the London Sinfonietta provided the sub-stance, the Canadian percussion stance, the Canadian percussion ensemble Nexus the lighter-weight filling. If it made for an over-long, slightly indigestible sandwich (with two intervals) there were at least two rewarding revivals included in the Sinfonietta's contribution.

Nexus's three pieces, effortless virtuosity, may be delivered with panache and dealt with swiftly. Music for Pieces of Wood is Steve Reich at his most unadulterated, written in 1973 just before he developed a taste for rich harmony and luscious textures, and exhilarating in its unadorned way; Cage's Third Construction is lively, colourful and quite cosy. Takemitsu's Rain Tree puts a trio of 'phones two marimbas, one vibraphone through its meditative paces: gentle swirling harmonies and overlapped pitch patterns which

grandeur, in others an uncut-tered exposition of its themes.

John Barton's fluent produc-tion is contained in an arena similar to that he used for Life Is A Dream: a bull ring effect of sanded floor with spectators boarded off on four sides. The

events are conducted with a cool might be deemed positively re-

freshing after the powerful excesses of Penderecki's opera and Ken Russell's film.

devil had possessed a group of

against a background of secular

envy, ecclesiastical plotting and omic expediency. I happen to feel that in theatrical terms,

Whiting never quite comes clean, or indeed comes off,

never explains whether Sister Jeanne is an innocent victim of

her own spinsterish lust or a scheming bitch of the first order. He is indecisive on the question of religious superstition.

conduc ted a scrupulously detailed account.

Lothar Zagrosek took charge any consequence.
The Sinforietta had also begun with music of no great consequence — Hindemith's first Kammermusik, which thrives on ebullience and of the remainder, ending with Liget's Adventures, Nouvelles Adventures, Nouvelles Adventures. But Dominic Muldowney's Saxophone Concerto, a Sinfonietta commission during last season, preceded the knockabout music theatre, and proved at first hearing a puzzing thing indeed. It is at onec a superbly successful vehicle for the soloist, John Harle, and a colourful exposition of Muldowney's highly flexible and polyglot idiom. But there seems to be a deeper, erreverance, but keeps itself within reasonable bounds.
Oliver Knussen's second symphony has recently been re-leased on record, but repeated hearings do not lessen admira-tion for its precocious assurance (Knussen wrote it when he was 18) or surprise at the realisation of how firmly formed his mature style was even then; there seems to be a deeper, less comfortable vein running there are things in it, not least the quick cross-cutting of melo-dic fragments, that are promi-nent in his most recent music. How genuinely "symphonic" it is I still wonder; here the four through it, a desperation about its mosaic of big-band dance tunes in the finale, a wistfulness about its central variations, that suggests a more disquiet-

poems by Traki, two by Sylvia
Plath — were sung by Dorothy
Dorow, favouring accuracy (up
to a high F at one point) over
tonal splendour. The composer

The composer

A much more concentrated contemporary music event at the ICA on Sunday, provided the opportunity to hear sometonal splendour.

year-old French composer Gerard Grisey. The ensemble, Circle conducted by Gregory Rose, played three of Grisey's scores from the 1970s, and immediately suggested a posi-tive and distinct creative perso-nality, with an ability to construct his music in large-scale, defensive blocks, with a well-

marked expressive profile.

Prologue for solo viola and Périodes for seven musicians, are the first parts of a cycle of five works each of which expand on its predecessor. In both solo and ensemble pieces the processes of elaboration and decoration were clearly defined, and coupled with a careful ear for sonority.

More impressive profile.

More impressive still was Tempus ex Machina, an impos-ing score for six percussionists lasting nearly half an hour, which retained a very firm hold on its material, worked to some thrilling and imaginative absolutely in its thrall.

The Devils/The Pit

Michael Coveney

Based on Aldous Huxley's The Devils of Loudon, John Whit-ing's 1961 play was the first new script performed at the Aldwych by the Royal Shake-peare Company. The revival in prioress who is rattled by the power of her own mastubatory superstition, miracles, religious orgasm and later exposed as a fanaticism and sexual obsession the Barbican studio is in some ways a denial of the play's epic grandeur, in others an unclut-

settings for soprano — two poems by Trakl, two by Sylvia

Neither is the ambiguity solved in 1961 Whiting intended the extravagance Russell in Estelle Kohler's brave per-play as a rebuttal of Royal formance as the crop-haired Court socialist realism. Since then the magic

pious fraud.'

In reviving the old war horse, brave flurries in the work of the RSC evokes what one critic Snoo Wilson. Barton's production described as "the climate of a characters trooping on and off great play" without actually on diagonal lines and muttering limbing the condition of the condition of the original production that the condition is all rather earnest, with described as "the climate of a characters trooping on and off great play" without actually on diagonal lines and muttering

Vanessa Redgrave unleased in the cinema.

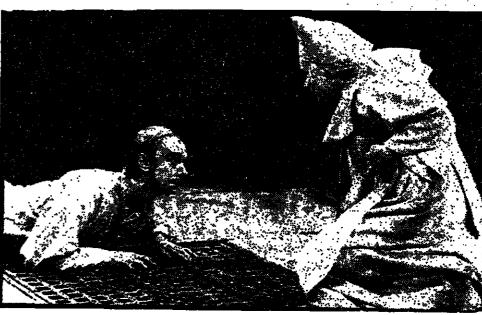
Grandier is played by Peter McEnery as rather too decent a sensualist who finds God by creating Him once lust has had its day. This is a sallow, re-laxed performance rather than a compellingly driven one. Else-where there is an entertaining clinching the case. It is a re-politely on their way. There velasquez portrait from Joseph minder, perhaps, that new plays goes Exmond Knight as a bishop of Conor as a commissioner and can have scale, scope and ambining a sedan. You do yearn, after a cosily rustic prosecuting tion in the Jacobean sense: even a bit, for the sort of tasteless clergyman from Mark Dignam.

[elepho

Parament, 1994

Section in the p

Be building to the



Peter McEnery and Estelle Kohler

BARCLAYS HOME MORTGAGE RATE

Barclays Bank PLC announces to existing borrowers that from the close of business on 3rd September 1984 Barclays Home Mortgage Rate will be decreased from 13% to



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Arts Guide

A selective guide to all the Arts appears each Friday

Music

LONDON

BBC Symphony Orchestra and Singers conducted by Pierre Boulez. Bartok, Berg. Pierre Boulez, and Debussy with Jessye Norman, mezzosoprano, Royal Albert Hall (Mon).

New Symphony Orchestra conducted by Antony Hopkins with Richard Markham, piano. Mendelssohn, Weber, Rachmaninov and Dvorak. Royal Festival Hall (Mon). (9283191).

Boston Symphony Orchestra and Phil-harmonia Chorus conducted by Seiji Ozawa with Edith Wiens, soprano and Jessye Norman, mezzo-soprano. Mahler's Resurrection Symphony. Royal Albert Hall (Tue). leademy of Ancient Music conducted by Christopher Hogwood with Em-

ma Kirkby, soprano, Margaret Cable, contraito, Ian Partridge, ten-or, and Stephen Varcoe, bass. Bee-thoven and Mozert. Barbican Hali (Tue).

Lee Arts Florissant directed by Wil llam Christie. Charpentier. St. Luke's Church, Chelsea (Tue,

Australian Youth Orchestra conducted by Sir Charles Mackerras with Bar-ry Tuckwell, horn. Tchaikovsky, Strauss, Richard Meale and Stravinsky. Royal Albert Hall (Wed).

patuer Viotti: Schubert (Mon 8.30 pm) Saint-Severin Church, Métro Saint-Michel

Alexandra Nomidou, piano: One Hour With Schumann (Tue 6.30pm) Town Hall of the 5th Arrondissement, 21,

bourg. Het Brabants Orkest conducted by Philippe Cambreling, Jean-Jacques Kantorow, violin: Mendelssohn, Martin, Elgar (Tue 8.30pm) Saint-Roch Church, 296 Rue Saint-Honorè. Guy Robert and Michel Amoric, lutes:

Lute In Contemporary Music (Wed 6.30pm). Musee Carnavalet, 23 Rue Sevigne, Metro Saint-Paul. Het Brabants Orkest, Brabant Koor conducted by Andre Vandermoot, Sheila Armstrong, soprano, Bernard Kruysea, baritone: Brahms (Thur 8.30pm). Saint-Roch Church.

Ars Antiqua de Paris - One Hour of Troubadour and Elizabethan music and Spanish Canconero (Mon. Wed 6.45pm and 9pm) Sainte Chapelle, upper part with medieval windows. Bookings 3405517 and on arrival

Philip Swanton plays organ music of 16th and 17th century in the Vottv-kirche, Roosevelt Platz, on Monday. New Vienna Baroque Ensemble con-New Vienna Baroque Ensemble con-ducted by Heinz Prammer with Bernhard Biberauer, violin, and Walter Sengstschmidt, Harpsichord, Vivaldi, Corelli, Haydn and Mozart Maria am Gestade, Salvatorgasse (Tue and Wed), Johannes Kroplitsch, piano. Chopin, Rachmaninov and Brahms. Rosen-dorfer Saal (Wed) (556681)

dorfer Saal (Wed) (656661).

Aug 25-30 finsicians' Orchestra conducted by Ljubomir Romansky, Beethoven and Tchaikovsky, City Hall Arcade Court (Thur) (42800/2085).

SALZBURG FESTIVAL Herbert von Karajan conducts the Vienna Philharmonic. Vivaldi and Tchaikovsky with Anne Sophie Mut-ter, violin. Large Festival Hall

ter, violin. Large results.

(Mon).

Herbert von Karajan conducts the Vienna Philharmonic. Schumann and Brahms. Krystian Zimerman, piano. Large Festival Hall (Tue).

Alban Berg Quartet: Mozart, Bartok and Schubert. Mozarteum (Tue).

WEST GERMANY

vitch, Alexis Weissenberg, piano. Hindemith, Beethoven and Fortner (Mon, Tue, Wed).

NEW YORK

New York Cheral Society (CAMI Hall): The summer-long series ends with Robert. DeCormier conducting an all-Bach programme (Tue) and all-Beethoven programme (Thur). 57th & 7th Ave (873 0096):

CHICAGO

avinia Festival: Kalichstein Laredo-Robinson Trio. Haydn. Mendels-sohn, Tchaikovsky (Wed); Larry Combs, clarinet, and Robert Wei-rich, piano recital Schumann, Brahms, Ravel, Benjamin (Thur).

Marie 1990

TOMORROW'S ELECTRONIC COMPONENTS MAY RELY ON THIN LAYERS CALLED SUPERLATTICES

GEC invests in tools for future chips

five different GEC laboratories

in a top-priority programme of "atom engineering."

GEC has recently installed two machines for MBE tech-nology at Wembley and plans to

have two more machines for MOCVD technology. As Dr

Roberts sees the investment, MBE is the most promising technique at present, but he is not yet convinced that MOCVD has been fully stretched.

In addition, he himself is pressing the suit of a third.

technology, a personal enthusi-asm based on using a powerful

ultraviolet laser to lay down layers of atomic dimensions. He

believes it could yet prove simpler to manage than its rivals. He calls it "the poor man's MBE."

This major GEC effort is also being married to that of two

that the new physics of sand-

wiches — "nanometre micro-electronics," as the Japanese call it—will lead to major advances in electronics and

opto-eléctronics, he is also a prime mover behind efforts to

persuade the Science and

Engineering Research Council to make a major national in-

By DAVID FISHLOCK

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A. P. Talley

mark tip to the contract of th

GEC—indeed British—missed advantageous," to quote Dr Cyril GEC's long-range research labout on the big immovations in Hilsum, chief scientist of GEC. ratory (which also comes under

But the challenge is not only the first billion-part chip. "The really exciting thing is that there could be some genuinely new obysics," says Dr Derek Roberts, GEC's director of research, and Lord Weinstock's chief counsel on new tech-nology. He believes fervently that the electronics industry is urgently in need of a better idea than "screwing more and more on to a single silicon

physics is forging new relation-ships between industry and universities in Britain. University departments which previously competed flercely for funds are forming consortia in the hope that government will thus be persuaded to pay for the expension of the compension of t ive new tools the new physics

The bonus could be a much The thinner and purer the more efficient partnership be layers of the sandwich, the more tween academe and industry, in which each understands more to be. clearly the part the other must play, and scientists move more

is the physics of low dimensional structures. It was opened a decade ago by an IBM scientist, Dr Leo Esaki, a Nobel prize-winning physicist at the Watson Research Centre near New York. cess so far — if the sandwich is He had the idea of making "club to be kept pure and free from sandwiches" of many very thin atms of oxygen, layers of different —aterials, GEC scientists admit that

silicon chips, which have been The electronic and optical pro- his wing), five to 10 years, comdominated by U.S. and perties of the sandwiches are pared with two-seven years.

Japanese research centres. But fundamentally different from The new team, under Dr Mike the company is plunging heavily those of bulk material. "It's a Kelly, is pooling the interests of

on what it believes may emerge as the semiconductor technology of the 1990s and beyond.

This is a technology which some scientists forecast could be the chips of the future. Over supplant silicon for chips having tens, even tundreds of millions ject were published that year. of electronic components, The excitement is not only compared with hundreds of about much more densely thousands for the higgest packed chips, or switching at integrated circuits sold today. 100 times today's speeds, but packed chips, or switching at 100 times today's speeds, but about the possibility of combining in one chip the properties of materials previously hard or impossible to marry. At the thicknesses involved, the films behave like cling film, stretching or contracting to conform to the learn honest.

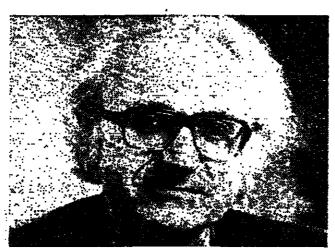
the layer beneath.
In MBE, films are deposited by boiling materials in a very high vacuum. Their vapour, unimpeded by other atoms, streams off in straight lines to

fall upon the scientist's target. Typically, the latest MBE machines — highly crafted pieces of engineering in stainless steel costing as much as £500,000—lay down a layer one atom thick each second. With exciting the properties seem

There are rival techniques, such as metal organic chemical freely between the two worlds. vapour deposition (MOCVD) in The field for this experiment which Thomson CSF in France is a leader. It may prove simpler to put into production, but the common factor is the need for a very high vacuum - higher than any other industrial pro-cess so far — if the sandwich is

atom unick each second. With careful timing the scientist can keep each layer to just a few atoms of absolutely pure mat-erial. Upwards of 100,000 would stack in the thickness of a coin.

vestment in British universi-The argument here is that, academically, Britain is well abreast of the new physics but its scientists have been obliged to rely on others to produce their samples on a "grace-and-favour" basis. It is proposed that the SERC should with Cambridge University One of the world's foremost experts. each only a few atoms mack. He they sat on the sidelines during ment—as much as £20m, some in the field, Dr Mike Pepper, is on the sidelines during ment—as much as £20m, some in the field, Dr Mike Pepper, is on the payroll of GEC's long-tices."



Dr Cyril Hilsum, GEC's chief scientist, has recruited a team of 12 to investigate atom engineering.

partment of physics, and the department of metallurgy behind the GEC programme.

GEC. The metallurgists added

another proposal, to study the properties of the new materials

The academics will not be starting from scratch. For example, Dr Colin Humphreys

of Oxford's department of metal

lurgy claims the record for the

world's smallest writing, done by an electron-beam technique

he invented while in the U.S. He

claims he can write in lines only I nanometre wide and drill holes only I nanometre dia-

metre. A million of these lines

would fit within the width of a biro line; 1,0000bn such holes

atom by atom.

major economies might be just- posal with one which will put hed in either case. the science of both the Claren-Spurred by the evident and don Laboratory, Oxford's deified in either case. unresolved financial problems of SERC, the universities thempering married to that of two
national centres of expertise in
the technology, at the Royal
Signals and Radar Establishment and the Martlesham laboratories of British Telecom.
So confident is Dr Roberts selves have shown unaccusselves have shown unaccustomed readiness to adapt to a new situation. Where once each department would have lobbied for its own facility, the cost of this new entrant to "big MOCVD, in a joint project with cost of this new entrant to "big physics" has forced a novel approach. Just as GEC's various research departments are pooling their effort in a con programme, built around the cluster of machines Dr Hilsum is buying, so university departments are grouping into con-

thus created, using their power-ful armoury of electron micro-scopes, and thus provide the physicists with the "process control" essential if they are to learn to build novel materials sortia. From such consortia will also come the technology for a new generation of production machines, it is argued. In Vacuum Generators of Crawley, Britain has one of the four lead-

proposed that the SERC should with Cambridge University. One now make a substantial invest- of the world's foremost experts called his sandwiches "superlated in which the science was evolving from the tices."

When Dr Esski first proposed these superlattices, no way of the invented a way of evaporating the layers, called molecular beam epitaxy (MBE).

In fact, the novel electrical properties Dr Esski predicted from his sandwiches did not appear. What appeared were substituted in the sandwiches in the sandwiches in the sandwiches did not appear. What appeared were substituted in the sandwiches in the sandwiches in the sandwiches did not appear. What appeared were substituted in the sandwiches did not appear. What appeared were substituted in the sandwiches did not appear. What appeared were substituted in the sandwiches did not appear. What appeared were substituted in the sandwiches did not appear. What appeared were substituted in the sandwiches did not appear. What appeared were substituted in the machines.

SERC is sympathetic but these with the machines.

SERC is sympathetic but the seconded to the would fit within the width of a titles with the seconded to the would fit into a pinhead.

Techniques of this kind will be essential to turn the new sandwiches did to turn the new sandwiches did to turn the new sandwiches did not appear to promising new areas of science, so far with no sign of sucess.

The Cavendish Laboratory, can been seconded to the science was evolving from the science was for intertion to the cavendish Laboratory, tuth has been seconded to the cavendish Laboratory, tuth as been seconded to the cavendish Laboratory, tuth as been seconded to the cavendish Laboratory, tuth as been seconded to the would fit into a pinhead.

Techniques of this kind will be essential to turn the new sandwiches into useful devices, for metaling withing a five-centiment of

OPTOELECTRONICS AND MACHINES

Light sensors

MACHINE TOOLS that form part of the automated factories two main components. First, of the 1990s could bristle with researchers design chip tiny optoelectronic sensors that sensors which may combine in record wear of cutting mechan- un area of a few square milliisms and the way that the tools metres a semiconductor laser

sor David Whitehouse, near or radation.

the centre for micro-engineering and metrology at Warwick university. He is participating in a research programme with industry to design such sensors.

By removing the need for a person specifications produced by the Warwick unrecess. son continually to monitor cut-ting activities, it could hasten

work is not confined to that turns out metal sheets in a Britain. In one of the longeststanding programmes of engineering co-operation between Britain and the USSR, Soviet of a cutting device in a lathe standing programmes of en-gineering co-operation between matton about, say, the rotation Britain and the USSR, Soviet of a cutting device in a lathe scientists and officials regularly or the depths to which tools are visit the Warwick centre, which started operations three years

And of the centre's research contracts from industry of about researchers at Warwick are £200,000, about half have come developing sets of computer from American companies. The instructions that take readings Warwick unit, which has a staff of 14, has also obtained grants of about £400,000 from the Science and Engineering Re-

search Council.

Prof Whitehouse started the centre after leaving the post of chief engineer at Rank Taylor Hobson of Leicester, an instrument maker. He says that micro-engineering and metrol-ogy (measurement theory) could become as important to engineering industry

ASTRONOMY

World's largest telescope

JAPAN will build the world's largest telescope on the island tories atop Mauna Kea operated of Hawaii by the early 1990s, by the U.S. National Aero-

are shaping metal parts.

That is the hope of Profesthat registers electromagetic sor David Whitehouse, head of Tadiation.

The work of the centre has

cut- the Warwick workers, asten The devices are fixed to suit-

the trend to unmanned machin-ing in engineering factories, Interest in Prof Whitehouse's ware, for example equipment

making an incision in a piece of metal. Signals from the sensors are fed into a computer.

In the second area of work,

from several different sensing devices and turn them into meaningful information.

In this way, a supervisor could monitor the output of an array of unmanned machine tools while sitting in front of a computer screen on the other side of the factory.

No machine tools in Britain incorporate these types of sensors at present, according to Prof Whitehouse. But several industry are showing interest.

equipped with a 7.5-metre (23.5-foot) reflector, bigger than

of Hawaii by the early 1990s, according to an astronomers' nautics and Space Administration, the University of Hawaii and a joint French-Canadament on Tuesday.

Discrepage will be the Netherlands are also constructing a joint radio telescope atop Mauna Kea.



Semiconductors

Japan opts for chips of the future

FUTURE electronic chips are likely to benefit from a manufacturing process recently de-veloped by the Japan Research and Development Corporation.

The process relates to the manufacture of integrated circuits from gallium arsenide. This is forecast to become the starting material for future high speed chips destined for the fourth generation compu-

Gallium arsenide allows mputers to calculate faster but use less power than conventional silicon chips. It is, however, expensive, a notor-iously difficult material to handle and has a problem that crystals usually have many defects.

Researchers at Tohoki University led by Professor Junichi Nishizawa have developed a process called photomolecular layer spitary. This is a way of controlling the growth of very thin layers of material—of the order of molecules thick—to build up

The process also operates at much lower temperatures than conventional ones-down to 350 degrees C compared with 600 degrees C. It needs an ultravacuum for operation and uses gases targetter outo the surface of a gallium arsenide substrate.

The researchers have already built transistors using the technique.

Moving shoes
CLARKS, the largest shoemakers in Europe turning
out 400,000 pairs of shoes a
week, is spending £3m on an
automated warehouse extension at its factory in Street, Somerset. The computers which will control product flow in the factory have to cope with up to 50,000 different products and 10 variations in box size.

SECURITY COMMUNICATIONS

Telephones on house alert

premises over phone lines. Base Ten Systems, the Fleet,

Rampshire electronics company, will provide about £0.5m worth will also inspect if the line is

The telephone communica-tions and computing segment of the system, from BT, is called Red Care, it provides an alarm carrier aervice over continuously available telephone lines from the protected premises, via the local exchange, through to a central monitoring station. The equipment on the protec-

terminal unit or STU, is per-manently connected to both the security sensors and the sub-scriber's telephone line. No dialling is involved and the line

Up to 11 of the usual sensors, are connected over dedicated itself. For example, the localinching smoke detectors, prespirate phone times to the Red tion of the computers is being sure switches, movement detectors, and computers, which kept secret.

The effect is to remove the

dialling is involved and the line is also always companied to the special scanning equipment in the local telephone exchange.

The subscriber can continue to use the telephone in the normal way and is unaware of signals and the acknowledge these signals and the acknowledge these surely system, which operates on two channels at frequencies too low for later examination.

The local telephone exchange occurred and which of the systems of they include Arles Court the total they include Arles Court they include Arles Cou

HRITISH TELECOM is introductors, window and door opening forward data to the appropriate ing a security communications detectors, can be connected to also company's central station, system in Landon in conjunction the STU. When one of them On the also company's with several security companies operates, producing a simple onthat offer "central station" off action or a change of voltage security monitoring services for level, the first of the channels premises over phone lines. is activated. vices, police and proprietor of

the premises can be telephoned.

The problem is displayed in plain English or can be printed cut, making the system "fail out to give a permanent record.

safe." The signal is transmissed The scanners and the comcut, making the system "fail out to give a permanent record-safe." The signal is transmitted in a format that is specific to each subscriber. There is, therefore, no prospect of criminals buying a system in order to discover the signal format.

On to give a permanent record.

The scamers and the computers belong to BT and are sited for best security and operating efficiency. The security company owns the STU and operates the central con-At the exchange, an electronic scanning system continuously examines each of the consumers' lines, descring cluding sensors. change within a fraction of a second.

Then, channel two, a data into action. This allows the STU to tell the exchange equipment instal and service the total

The local exchange scanners over the security of the system

18-month-old recovery in Japan gathers momentum as domestic demand picks up

This year's growth rate pro-jections for all of the OECD economies have been revised upward: examples - from 5 to per cent for the U.S., from 2 to 3 per cent for West Germany and from 3.5 per cent to 4.25 per cent for the entire group. The recovery of the Japanese economy is also quickening, led by vigorous expansion of the

After hitting a low point in February 1983, the Japanese economy has been in the process of recovery. It is looking increasingly bright as has become clearcut.

Recovery of business capital investment has been particularly pronounced. It was responsible for 0.68 point of the 1.1 per cent gain in gross domestic private demand in the first three months of this year over the preceding quarter. Capital spending is believed to have continued to be strong in the subsequent months in the light of the trend of orders for machinery, a leading indicator, among other things. The Bank of Japan's short-term business survey (made in May) underscored the trend by showing that leading manufacturing concerns' capital investment programs for fiscal 1984 are 11 per cent ahead of their spend-ing in fiscal 1983.

Another area of recovery is housing. Housing starts stayed above the year-earlier level for four months in a row since Febroary; the year-to-year increase was particularly large in April and May — 10.9 per cent and 16.8 per cent, respectively. Housing investment appears to be coming out of the prolonged doldrums that set in ollowing the second oil crisis, thanks to continued stability of building costs and a lowering of the housing loan interest rate (city banks, for example, reduced the rate to 7.92 per cent in April, the first time in about five years that it has come down below 8 per cent). A conconsidered to be in store.

It also looks safe to assume that personal consumption will perk up gradually with summer sales and leisure activities as

boosters. There are a few developments that support this umption — increasing overtime income and employment, coupled with summer bonuses which are believed to have grown by a margin larger than last year's. Thus, growth of disposable income is likely to pick up gradually.

In the meantime, exports, the locomotive of business recovery, are maintaining a robust uptrend. On a customs clearance basis, they increased 20.3 per cent during April through June over the corre-sponding period of last year. Those to the U.S., a market that accounts for about one-third of Japan's total exports, posted an outstanding increase of 49.4 per cent. The growth rate, however, is expected to slow down in the months ahead because the U.S. economy is forecast to expand at a more sober pace in the latter half of the year.

Despite a likely slowdown in expansion of exports, the Japanese economy will continue to achieve balanced growth for the time being because domestic demand stands to assume increased strength from a pickup of not only corporate capital investment, but also of personal

Continued stability of <u>prices</u>

One feature of the present recovery process is continued stability of prices. In June, for example, wholesale prices remained flat from the precedi month and went down by 0.4 per cent from a year earlier, while consumer prices in Tokyo dropped 1.0 per cent from the preceding month (but up 2.4 per cent over a year earlier). plain the remarkable price stability:

 Fall of unit production cost due to moderate wage increases for two consecutive years (4.4 per cent in 1983 and 4.46 per cent in 1984), coupled with a sharp rise of the operating rate (an increase of 13.8 per cent between February 1983

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2) Falling import prices owing to softness of primary product prices (including those of crude oil) as well as a continuously high exchange rate of the yen in comparison to the previous quarter.

3) Smooth improvement of supply and demand balance reflecting a moderate business recovery.

A sharp rise in prices is un-likely for the time being. As for wholesale prices, upward pres-sures will remain weak as a whole because forces that work to drive up prices, such as the yen's depreciation and a tighter supply-demand balance ensuing from business expansion. are expected to be largely cancelled out by downward effects from the cost side. As long as wholesale prices remain ca consumer price advance will consequently be moderate.

Balance of payments and yen rate

In the movement of international balance of payments, a rapid swelling of trade surplus stands out. While it was already gargantuan at \$40 billion at an annual rate during the January-March period, it fur-ther balloned to a \$44 billion rate on the average for April through June. The fact that the sur-plus with the U.S. is particularly prominent could rekindle a trade dispute with that country and criticism of a yen

Since the non-merchandise trade deficit is stabilized at an annual rate of approximately \$10 billion, any increase in trade surplus leads to an increase in current surplus also.

Despite the cumulative current account surplus, the yen's exchange rate against the dol-lar has been weakening since May. It dropped past the 240-tollar level for the first time in 10 months in July. Among several factors that

keep the yen declining, an important one is expanding deficit in the long-term capital account that became notable in the last half of 1983. The longterm capital account deficit her London Branch: 4th & 5th Floor, P&O Bidg., Leadenhall Street, London EC3V 4PA, England

since almost offset or surpassed the current account sur-

Especially, the recent high level of long-term fund outflows appears to be caused by a broadening interest rate differential between Japan and the U.S. Measured in the secondary market yield of longmaturity government bonds. the difference between the U.S. and the Japanese rates broadened to 6.03 percentage points at the end of June from 4.55 percentage points at the end of last year. The difference in the inflation-adjusted rate broadened to 3.54 percentage points at the end of May from 2.03 percentage points at the end of last year.

As U.S. interest rates are expected to continue at a high level in the future, the weakness of the yen could be pro-longed, and that can harm the Japanese economy in several ways. The currency's weak-ness, first of all, could aggravate trade friction as it is taking place in the midst of a bal-looning trade surplus. Second, it also could adversely affect prices through a rise in import prices. Third, it could trigger a fall of domestic bond prices and push up interest rates, putting a brake on the economy's expansion which is just starting.

Deteriorating bond market Already, the third scenario is

becoming a reality. The upturn of U.S. interest rates since early May has led the Japanese bond market to decline, resulting in a rise in secondary market yields. One side effect

cellation of government bond issues scheduled for June and July owing to disagreement between the Government and underwriters over the size of a turn has made it also harder to float municipal and corporate

of this development was can

Since the stock market has turned bearish along with the drop in the bond market, convertible bond issues, which were proceeding smoothly in both domestic and overseas markets, are showing signs of

The Japanese bond market is thus increasingly sensitive to the movement of U.S. interest rates. If the U.S. interest rates continue to rise and the yen and Japanese bond market continue to fall, one unavoidable consequence seems to be an across-the-board change in long-term interest rates. A rise in long-term interest rates, however, will not lead to a change in the monetary policy, given the current trend of

domestic business and prices. Upswing of business is leading to a surge in demand for operating and capital funds sized corporations of late, and financial institutions are showing willingness to meet the rising fund demand.

Under the circumstances, the Bank of Japan has allowed city banks to increase lending by 39.9 per cent, or ¥2,780 billion over a year earlier for the three months from July to September. Corporate finance thus is expected to stay lax in the months to come.

Comparison of GNP and Prices in Recent Economic Recovery 106 -- 1983 1st gr-1984 1st gr . 1976 1st ar ---- 1977 4th qr-1978 4th qr - 1975 1st ar-1976 1st ar ≨1978 4th qr ਨੂੰ 104 署 103· 를 102 -101 .1984 1st gr 100 -100 101 102 103 104 105 106 107 (Real GNP)

Note: The moves of real GNP and GNP deflator (seasonally adjusted, each) in the if three periods of economic recovery are shown in an index with a bottom falue as 100. Source: Economic Planning Agency, "Annual Report on National Account"

Talk it over with DKB. The international bank that listens.

The next DKB monthly report will appear Sept. 20.

TWO SOFTWARE COMPANIES AIM FOR GROWTH

Serving personal computers

TWO COMPANIES, PMI and RTX Computer Services, that started life as departments within large organisa-tions are moving into the personal computer field. IMI Computing, part of the IMI Group, has introduced software which is aimed at decision makers in big companies. Called Host Inter-face Manager it allows ISM

mainframe computer and tailor it to the user's specific The idea is to make com-munication and transfer of information between mainframe and computer as simple as possible. A manager could, for example use any IBM PC in a building by

personal computer users to take information from a

inserting his special floopy disk into the machine. This contains details of the way in which the data is to be extracted from the mainframe. IMI Compating is a large IBM user running a complex on-line compater system for the companies within the £670m turnover IMI group. More than 400 terminals are

connected via telephone lines to a large computer system. In the past two years the company has offered its services to companies outside the group and this business now nts for more than 25 per cent turnover. From September, RTZ Computer Services has available a software program for personal computers. Called MicroCAIRS, it is a way of storing records and quickly retrieving information. This is a microcomputer version of system which has been

on larger computers. The software is designed to handle information such 25 namile information such as technical data, personnel records and statistics. An optional thesaurus can be incorporated when hunting for related topics. On a 10 Mbyte system MicroCAIRS can handle more than 10,000 records—each up to 500 characters long. In May, the company sold part of its business to. McCormack and Dodge in

order to concentrate on the

development of its own soft-

vare products mainly for the

larger organisations.

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Tuesday August 28 1984

Sri Lanka's ethnic rift

Lanka to open the Victoria Dam. the UK contribution to the Mahaweli River diversion scheme, she, too, will doubtless be struck by the depressing contrast between the economic and the political outlooks for the country.

On the economic side there is the gradual improvement brought about under President Jayawardene's more liberal administration, on the political side, the all-eclipsing Tamil problem. This has now acquired the same feel of intractability as the divisions of Northern Ireland, as visitors to the Test Match have been reminded.

Moral high ground

The situation is not particularly bloody at the moment and in much of the island life goes on as usual but the events of the summer of 1983, when the majority Sinhalese inflicted uncontrolled violence upon the homes and shops of minority Tamils across the island, were one of those irreversible tragedies which create a mirror-world of irreconcilable views around minority problems everywhere: terrorists — free-

dom fighters; law and order—repression; political solution—sell-out and so on.

So today the bulk of the debate within and outside Sri Lanka focuses more upon the behaviour of the security forces as they try to counteract the activities of Tamil extremists than upon the underlying probthan upon the underlying prob-lem that makes their deploy-ment necessary. The question of who has the moral high ground has become more im-portant than the question of what the whole argument is

Any hope of restoring an un-Any hope of restoring an un-easy modus vivendi to the Sin-halese and Tamils of Sri Lanka must involve three elements. Tamil terrorism has to be more effectively suppressed at its source. The Sri Lankan security forces must become much more efficient, disciplined and dis-criminating in dealing with Tamil and Sinhalese lawlessness. The Government in Colombo has to be prepared. because of the damage done last summer, to go further than seems desirable or politically comfortable in devolving power to the regions.

the Tamil terrorist movements are too sophisticated to be in his own government.

spontaneous expressions of Tamil frustration. They are trained in, and supported from, the state of Tamil Nadu in India only a short boat journey

Mrs Gandhi, badly needs the support of Tamil Nadu in her forthcoming parliamentary elec-tion, and it is understandable that after the treatment meted out to Sri Lankan Tamils in the past year, she is very loath to appear to assist in any way in suppressing their justifiable Yet it is counter-productive

for her government to assist, as it has ably done, in bringing Tamil politicians and the Gov-ermment in Sri Lanka to the bargaining table, if these discus-sions are then made futile by terrorist operations supported from Indian territory. Mrs Gandhi should crack down much more toughly on the Indian end of Tamil terrorism. All reports from Sri Lanka suggest that the Government's suggest that the Government's troops are not up to the demanding task of containing terrorism without translating it into ethnic violence. The National Security Minister, Mr Lelith Athulathmudali, needs all the help he can get from outside advisors in creating a more selective and effective internal security

So far this advice has been obtained somewhat furtively from Israel and from a private company in the Channel Islands. There is a straightforward case for the UK sharing its experience with Sri Lank in attempting to fight terrorism without resorting to indiscrimi nate reprisal.

Both these changes must be accompanied by a willingness of the Jayawardene Government to concede more of the regional autonomy that the Tamil political party, the TULF, has been demanding.

A cursory examination of the ethnic and religious makeup of the different provinces of Sri Lanka shows that a separate Tamil entity is a total impossibility. But there are areas, particularly in the north of the island, where Tamils are in the overwhelmingly majority and where a greater devolution of authority to receive a devolution of authority to the received administration of the second action of the se There is a consensus among authority to regional admini-recent visitors to Sri Lanka that strations would re-inforce the the Tamil terrorist movements Tamil's sense of involvement

Frustrations of the exam system

YOUNG PEOPLE whose plans the entrants are doomed to fail.

Besides being an inapproquate examination grades will feel the more frustrated this people's life prospects, the year because of criticisms of the exam system first voiced publiely in January by the Secretary for Education and Science. Sir Keith Joseph at last dispelled a widespread illusion about the 16- and 18-plus examinations which have an increasingly decisive influence on teenagers'

sure that they had been fairly found wanting by objective and constant standards. They could also be sure that by resitting the exam and improving their performance they would obtain a higher grade next time round.

Interpretation

The reality, now confirmed by the Education Secretary, is that they cannot be sure of either. Candidates in subjects which attract mass entries are not graded by objective yardsticks of what they know and can do. Instead the grades are primarily determined by statistical rules which measure each entrant's performance only relatively against the performances of the

competing candidates.

The level of understanding required to obtain a given grade can vary with subject, from one examining board to another, and over time. At 18-plus especially, the statistical boundaries separating the middle grades are so close together that variances in interpretation between people marking the papers can make the difference between a "good" B and a "poor" D.

Consequently the same level of knowledge and skill that gained entry to higher education or a desirable job 12 months ago might well have been rejected this summer, or vice

Candidates just below the What is more, as Sir Keith borderline may owe their has also pointed out, if position, not to any fault of recruiters put less stress on same exam. Moreover, from the want in young recruits, such as outset, a certain proportion of ability to work in teams.

Besides being an inappropriate way to determine young people's life prospects, the present grading system—as Sir Keith has said — serves to demotivate a good many teachers as well as pupils.

He therefore wishes to charge

He therefore wishes to change the system so that the grades reflect, as far as is possible, absolute standards of what candidates know and can do. He has so far spoken of making are nas so far spoken of making the change only at 16-plus, award of a specific exam grade although not until a few years testifies that the candidate possess a specific level of skill for Ordinary levels and the subject concerned. award of a specific exam grade attough not until a few years testifies that the candidate after the present separate exams possess a specific level of skill for Ordinary levels and the in the subject concerned.

If that were so, entrants falling short of the mark would at General Certificate of Secondary Educations that they had been fairly.

But if grading by objective

But if grading by objective yardsticks worked well at 16-plus, there would be good reason to make a similar change av 18-plus.
The trouble is that nobody yet

knows whether it is possible to devise an adequate system of grading by absolute standards. For example, at 16-plus, a first-rate mathematician has about 130 different skills. Test-ing each one by its own appropriate yardstick would make for an impossibly long exam. Experts are trying to find practicable solutions to such prob-

Arbitrary

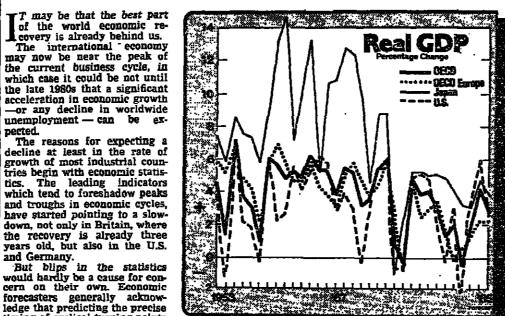
But even if they succeed— which they may not—the present inconsistent and arbitary system of grading will continue for a good many years.
In the meantime, however, employers could do much to reduce the ill effects by revers-

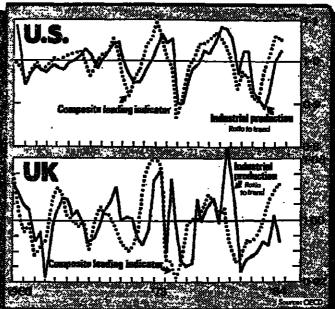
ing their policies of increasingly demanding exam successes as a condition of recruitment.
Ability in the examination room has no necessary relation with the ability to do skilled work well.

The National Computing Centre has proved, for instance, that teenagers without any pass grades at 16-plus can become good computer programmers and operators.

their own, but to some chance exam passes, schools would be event such as another school's under less pressure from having recruited an inspired parents to concentrate on teacher who has boosted the examination subjects and so performance of a whole class of have more time to develop other teenagers competing in the attributes employers say they

THE WORLD ECONOMY





Perhaps the best is already behind us

Anatole Kaletsky takes a gloomy view of the possible outlook for economic growth and argues for a revival of cyclical management policies

All these forces could soon be pushing in the same direction -downwards

and Germany.

conomic forces.

timing of cyclical turning points

in their repertoire. Some of the indicators which economists use for these predictions can be ex-

tremely volatile; stock market prices and investment intention

surveys, for example, can turn out to be reflecting temporary

factors like strikes or political tensions as much as underlying

Unfortunately, there are deeper reasons for apprehen-siveness. They can be divided

have occurred already, but will continue to exert an influence

on events in the period ahead.

Then there are the natural cyclical tendencies always pre-

sent, to greater or lesser

These are the fluctuations in

output which occur because businessmen's decisions on stockbuilding and investment

degrees, in market economies

into three groups.

First, there are seconomic developments

are influenced not just by the present level of demand for their products, but also by their expectations about future demand, which are seldom

Finally, there are the policies pursued by governments authorities. monetary era, governments consciously attempted to counteract the cyclical tendenies in their economies; but since the political revolution of the late 1970s against Keynesian theories about demand manage-ment, the impact of ment, the impact of government policies on the business cycle has been a controversial and uncertain issue. What makes the current situation discouraging, particuare still unemployed in the domestic demand has grown OECD area after the last recessmore slowly than total economic

on OECD growth), is that all of these forces could soon be push-ing in the same downward direction and in a mutually reinforcing manner. Consider first what has already happened. The most

ments has been the dominance of the U.S. economy in the current recovery. The leading role which America has taken is shown most obviously by the shown most obviously by the gap of nearly 4 percentage points between GNP growth in the U.S. and Europe (see table). And the GNP figures actually understate the true force of the U.S. learnestive. U.S. locomotive.

Because of the strength of the dollar, much more than usual of America's domestic expansion has spilled over into overseas demand. The biggest beneficiary has been Japan (exports to the U.S. make up 29 per cent of total overseas sales for Japan; only 9 per cent for Germany). But even Europe has recovered largely because of the booming demand for its

exports.

If Europe had relied entirely on home-made economic expan-sion, or if President Ronald Reagan had heeded Europe's moral indignation about budget deficits, the world might still be stuck in a self-righteous slump. For Europe's firm abstinent from reflationary domestic policies, failed to promote policies, failed to pro "spontaneous" recovery. sion (to say nothing of the activity, implying that the billions in developing countries growth of exports was the main who are even more dependent driving force behind recovery. As the table shows, this relationship between domestic and external sources of economic recovery is sharply reversed in America and Britain, the

only two major countries which

their

stimulated

economies with big fiscal expansions in 1983. The difference of 51 percentage points between the growth of domestic demand in the U.S. and Europe this year, is one striking measure of

The warning implicit in all these statistics is that the world ecovery may be quite vulnerable to a slowdown in the U.S. economy. This is where the natural cyclical tendencies

These inbuilt forces presum-ably still exist, as they have throughout economic history, despite the forecasts or assumptions of steady growth built into many governments' budgetary plans—notably the 4 per cent growth annual rate from now until 1989 forecast recently by the Reagan Administration.

Partly as a result of these natural cyclical forces, the U.S. economy is likely to decelerate

along with most economists, assume that the slowdown has already begun. The OECD's July forecasts showed America's growth rate declining to an annual rate of 34 per cent in the second half of this year and 2½ per cent in 1985. The recent upward revision, to nearly 9 per cent, of the first half 1984 any eventual fall will be

In fact, if the OECD's predictions are realised, next year's economic slowdown could be one of the sharpest in recent history. The effect of this set-back in the U.S. would be to cut 1½ percentage points from the industrialised world's total growth rate.

But the OECD forecasts,

which are confined to the immediate outlook, do not show

HOW T	HE RECOV	ERIES	сом	PARE
js.	% Growth of:	1983	1984	1985
	GNP	3.4	6	2 1
	Domestic demand	4.6	71	3
арап	GNP Domestic demand	3.0 1.5	4 <u>1</u> 3 <u>1</u>	33
W. Germany	GNP	1.3	3	23
	Domestic demand	1.9	21/4	13
ж	GNP	3.1	2 <u>1</u>	2½
	Domestic demand	4.7	3	2½

Indeed, the financial markets, down. Cyclical downturns, once started, do not suddenly reverse themselves a few months later. If the world economy begins to slow next year, it is almost certain to perform even worse in 1986. For example, one leading forecasting firm, Wharton Econometrics, which broadly agrees with the OECD's 1985 figures, predicts a further slowgrowth figures, suggests that the down to only 1.1 per cent by U.S. economy may still be 1986 in the industrialised counstronger than the OECD tries as a whole, 1 per cent in expected; but this means that Europe, 0.6 per cent in the U.S. any eventual fall will be and 2.5 per cent even in Japan.

That kind of decline, with its concomitant lengthening of the dole queues, can be described quite unequivocally as a new The fact that there may be

another recession in 1985-86 is due largely to the third element in the present economic con-juncture: government policy. Although some sort of cyclical downturn in the U.S. seems unavoidable at some point in the next year or so, it need not have implied recession, or even discomfort, for the world economy as a whole.

peak level of growth rather nomic policy makers today lower than the 10.1 per cent Rather than "fine-tuning" rate registered in the first macro-economic politices to the quarter of this year. And irrespective of whether America managed to achieve a controlled policies in granite—be there "soft landing," the impact of the "tax cuts, Mrs Thatcher's the world could undoubtedly Medium Term Financial have been offset by an acceleraStrategy or the "budgetary contion of growth in other counsolidations" of Germany and
tries. In practice, however, both
Japan,

of these possibilities now appear sufficiently remote to make it legitimate to use the past conditional tense.

In the U.S., the Reagan Administration continued to pump demand into the economy with ever-larger budget deficits well after the useful pump-priming effect had been accom-plished. But by late 1985, which is the earliest date that a substantial tax increase to reduce these deficits could conceivably come into force, it will almost certainly be too late to reduce the budget deficit for the duration of the current economic

For a tax increase late in 1985 would further weaken the economy when - according to this argument—it was already sliding downwards under its own weight. Without a tax own weight. Without a tax increase, however, the natural tendency for investment to weaken and for consumers to save instead of spend during the later stages of the economic cycle, would be exacerbated by high interest rates, the strong dollar and growing worries about inflation. Thus, however much the President would like about inflation. Thus, however much the President would like to prevent the U.S. economy from slowing below its "trend" growth rate of 3 or 4 per cent, Mr Reagan may be unable to do anything to sustain this kind of growth.

In Europe and Japan, by contrast there is scope to stimucontrast there is scope to sumu-late further recovery. European governments certainly have no inclination deliberately to take over the locomotive role which America has been performing

America has been performing so effectively.

If current policies and trends persist, domestic demand will be growing more slowly than total national output in every major country outside America in 1985, as the table shows. In other words, Europe and Japan may still be seeking export-led

Europe and Japan synchronising economic cycles with the U.S.

growth from America next year even as the U.S. economy move towards recession. Even by 1985, after four years of con-tinuous austerity European governments will probably remain unwilling to drive their econo-Acrossic consumer spending stimulated by tax cuts

From an international stand-point, the most unfortunate corollary is that the econom cycles in Europe and Japan seem to be becoming fully synchronised with the American cycle. Were Europe willing now to pursue a more independent to pursue a more independent policy, economic fluctuations in the two major economic blocs In theory, the U.S. economy could have been allowed to decelerate quite gently from

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AT ALL W

control of cycles, politicians today prefer to engrave their

Cadbury takeover talk

With this year likely to be a record one for takeovers in Britain, it is interesting to see someone like Sir Adrlan Cadbury saying at a meeting last week, in off-the-cuff remarks, that he did not think takeovers, per se, were a good thing. His statement appears to have struck sympathetic chords in the business community.

Asked to elaborate on what he meant, Sir Adrian told me that he was answering a ques-tion at a press conference about whether he feared being taken over or whether he planned takeovers himself. He said that te answer to any takeover was not a jazzy Public Relations defence but improving earnings

per share.
"After all if you are improving your earnings per share each year by increasing efficiency why should the shareholders want some other management."

As for taking over companies he said: "I am hardly likely to announce it through the columns of national newspapers

first am I?" His basic point about takeovers, though, was there had to be a real commercial logic. Big often meant worse in his opinion. "There are always human problems when you expand in

size. You have to make sure there are enough people around to round the show." "I suppose we are talking about the old sixtles buzz word. synergy. Where you can make two plus two make more than four, you are in business," he

went on. Sir Adrian Justifies a recent Cadbury Schweppes takeover. In the U.S. Cadbury took over Peter, Paul, a large confect holdings in company A and tioners. They had an estab-company B, rather than have lished distribution network in the U.S. whereas Cadbury had

"On the other hand," as Sir Adrian puts it, "we were able to help them in the same way in Canada." He believed, then, in a meshing of companies if there was some area where one

Men and Matters

"In the 1960s you had milk groups combining with breweries and so on," he said. He thought that any company wishing to take over another with a similar product range ought to think very carefully about it.
This column, while in no way

attempting a systematic sound-ing out of top executives, had a hittle Bank Holiday ring around and asked various executives what they thought of Sir Adrian's remarks.

Lots of sympathy

Daniel Hodson, Financial Director of Unigate, said: "I certainly have a lot of sympathy with and am very interested in what Sir Adrian said. There are various criteria. If you took, say, at an average company which had been involved in takeovers I bet you would find that on the basis of improved earnings per share at 5 per cent a year since there are very few companies which have done

very well."
"So often have we seen mergers which have just meant shareholders have pooled their assets, and not very much useful is done with the enlarged assets. I can think of a number of instances where from the shareholders point of view it is better to have separate sharethem combined in one, he said. "You must ask yourself what is the value added. Its alright for companies to grow organic-

ally and add little acquisitions here and there if it improves the organic process."

He continued: "I don't know whether Sir Adrian was looking sideways at Tate and Lyle's bid

He also thought there was a for Brooke Bond when he made logic in the single product his remarks. But any takeover company getting together with which has a massive overlap in

In agreement

Possibly surprisingly Neil Shaw at Tate and Lyle also feels that takovers for their own sake are not necessarily a good idea. "Just taking over companies for size is like saying growth for itself is a good thing," he

What then did he feel was the

logic of his own company's attempt to buy Brooke Bond.? "There is a communality of interest on the tea side particularly. Given our experience in sugar, with growing, packaging and distribution and our involvement in the Third World generally, there is a lot we can do on the tea side. With other areas of the company we per-haps do not have the experi-

giamour area but we do not have the management range to enter this area. There would be no point in us attempting to go nto a field where we do not have the necessary expertise.
"You would sell off this part
of Brooke Bond then?" I asked. "I imagine, this and the butchers' shops, we don't know about butchering."

Timber is becoming

Feels strongly

more emphatic that takeovers should not be entered into lightly. I feel very strongly that you should not buy other companies unless you are sure 2 and 2 are going to add to more than four. The com-mercial logic might look alright, but then the financial and

square." He added, "long be-fore my day, Courtaulds, as you know, bought left right and centre everything in sight. I can tell you that there are an en-ormous number of headaches in stretching your management to run concerns they do not know anything about." Owen Green at BTR seems to manage Green at BTR seems to manage and there are American con-giomerates like United Tech-nologies, or Jimmy Hanson's group. But whether these sprawling conglomerates only last as long as the entrepre-neurs who set them up I don't

"Of course, the current take over boom does have an effect Any chairman wh wakes up in the morning and reads that a company in his sector is making a takeover bid feels a certain twinge. He worries that his shareholders are going to say he is not dynamic enough. There is a strong element of pressure if everyone else is busy. But I do not feel one should go on a takeover spree just for short term results."

Often overlooked

David Donne, Chairman of Daigety feels that the insti-tutional shareholders are often overlooked. "You have got a situation now where the institutions are important share-holders in any major company. Generally they like to stay with the management they know."

"Where a management is underperforming in one's par-ticular sector, one know's about it. But one has to restrain oneself from plunging in for quick turnaround if there is to be no lasting benefit," he

"Then again," he said, "integrating vertically because you think you are going to save money does not always work. Verticality killed the Christopher Hogg, the chair- work. Verticality killed the man at Courtaulds was even British textiles industry. Well the carpet industry. In my view carpet manufacturers paid too much for raw materials because they came from the same group. There was no element of competition in purchasing.

Observer

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Where people like to work

THERE ARE two main differ-ences between President Reagan

and Mrs Thatcher as politicians. One is that Mr Reagan is remarkably popular among a majority of Americans, even

among some who will not vote

The other is that in the last

two years he has presided over an unmistakable economic re-covery. When Mr Reagan came to office four years ago, the misery index (the combined

rate of inflation and unemploy-

ment) was 21 per cent. It is now below 12 per cent—less than the British unemployment rate

The Republicans are trying

to establish themselves as the

majority party and to do so

they put it, by breaking with liberalism and embracing

liberalism and embracing conservatism. In this, they have

partially succeeded. They have,

after all, won every presidential election since 1968,

except for President Carter's

and spoke of patriotism.

said, went astray only under

are distinct Anglo-

Yet, the differences

American similarities.

victory in 1976.

British

there

Labour costs and world markets

"ensuring that the country is that none of these calculations not priced out of world markets is based on any arbitrary startise child's play" (Lombard ing date for PPP "equilibrium," is child's play " (Lombard ing date for PPP "equilibrium," August 20). This is clearly true but instead make use of a defit the nominal exchange rate tailed OECD survey on interalways shifts to offset changes national price comparisons up-in relative cost or price infla-dated as necessary by price tion thus preventing any loss changes since 1975).
of international competitive. Nominal exchange rate depreor Merinaudian competitive monass. Yet such stability in the cation has undoubtedly eased the loss of competitiveness in observed empirically. Many other factors determine changes the reverse process helped the model of the mo to nominal exchange rates besides relative infiation rates; for
1979-81 period, but the Employthe UK, North Sea oil, international capital flows and about a continuing rise in UK
changes to economic expectalabour costs when German costs tions have all had important are constant. The same real ex-effects in the past 5-10 years. change rate calculations for the From 1977 to 1981 UK rela-tive normalised unit labour already "under-valued" relative normalised unit labour already "under-valued" rela-costs rose by almost 60 per cent tive to sterling by about 60 per after allowing for offsetting ex-cent. change rate movements on the IMF measure. Since then some IMF measure. Since then some evidence that real exchange improvement has occurred, but rates are far from stable at their relative to the OECD's 1975 PPP equilibria (even in the survey of purchasing-power-relatively long run) as the acaparity (PPP), sterling may still demic debate on "overshoot-be 50 per cent "overvalued" on ing "has now recognised. Those labour cost grounds. The loss framing monetary policy should of UK competitiveness is con-recognise it also. firmed by a study of relative J. Hale, price inflation. On an average of

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the US.

Sir,—Samuel Brittan writes: the order of 40 per cent. (Note ensuring that the country is that none of these calculations

There is little doubt from this

consumer, wholesale, and export price inflation, sterling over-valuation against the trade-

Profitability of air routes

From Mr R. Hodge
Sir,—Mr Bishop (August 21)
indicates that because British
Midland Airways allegedly has
Midland Airways allegedly has
made on the basis of past profit
made on target and particular a better profit record on certain air routes than British Airways, the longer term security of these routes and the jobs that go with them should be entrusted to BMA.

As far as I know, the profitability of individual air routes would be guided by customers and the profitability of individual air routes would be guided by customers are the adequate to the comparable?

ability of indivdual air routes would be guided by customers' is not the subject of public opinions as to the adequacy of accounts. Each airline presum-ably has its own methods of allocating expenses and these may not be entirely comparable. What seems clear from the

sent public discussion, however, is that certain airlines are Park Mount, 259, Bristol Road,

BA's regional air services

From the Marketing Manager, UK Domestic Market Centre, Britisk Airwoys.

Sir — Michael Bishop of British Midland Airways sug-gests (August 21) that British Airways is willing to operate regional sir services "through cross subsidy or at a minimal

I do not know on what he Chris Swan.

bases this assertion. The fact PO Box 10.
growth of our regional centres. Heathrow Airport (London), are now profitable. Far from Hounslow, Middlesex.

reducing regional air services,

past and present regional air services rather than on figures prepared by the interested airline companies.

recession eases.
Our customers need not fear for the continued operation and growth of our regional centres. We are there to stay, and to improve the service we offer them profitably, of course. We are confident our future shareholders will endorse this policy.

The Royal Dockyards campaign

Inc koyal Dockyards campaign

From Sir John Mallabar

Sir,—On August 2 you printed a letter from Mr Miller at Devonport Dockyard expressing his dismay at the conclusions of the Commona Public Accounts Committee. I have since obtained a copy of the report, from which I will quote. In 1988 I was appointed chairman of a committee set up to examine the systems of control and accountability operating in relations to, in effect, the Royal Ordnance Factories and the Royal Dockyards. We came down unanimously in strong support of the sure.

Me came down unanimously in strong support of the sure.

Marauoun or grey area of their home markets by most testraints and unpredictable safeguard actions, such as existed before it came into own barriers is not acceptable effect, and such as apply in own defict, and such as apply in of opportunity in trade is impossible with more than a much less damaging to the internationally agreed MFA is much less damaging to the internationally agree

in strong support of the sug-gestion -that trading funds should be established both in

ne views of the Area Flag Officinto study for implementation cer prevail over those of CED. and was overtaken by the Note long after we reported, the contract with the civilian CED was terminated and that was then put into study for implementation and was overtaken by the review of defence in June 1981."

We are now over 10 and that was then put into study for implementation and was overtaken by the review of defence in June 1981." CED was terminated and the post has since always been filled by a naval officer. We did not feel that such an officer was likely to prove as effective in the task as a civilian. I would emphasise that I intend no critibut mean only that the experi-ence and background of a civilian appeared to us to be the more desirable qualification.

We considered the aim of the initiative . . . was then begun well . . Pro dockwards should be "To comto be studied."

Are we to have another 10 of investor protection has Upton Britton & Lumb,
the required standards and in years of this nonsense, and the minimum time nermitted by what will the cost be?

Professor Gower in his review
Upton Britton & Lumb,
already commented on disunity 9, Leigham Hall Parade,
in the industry. Mr Stewart Streatham High Road, SW15. the minimum time permitted by the agreed estimate of costs." I can sympathise with Mr and went on to amplify the way Miller's appeal for a period of in which our definition should stability without yet another be operated and the manner in which any conflicts which might him that there is no need for arise should be reolved. We change. I would suggest it has considered that it should be been delayed unduly.

Possible to implement our proMeanwhile, the order poseals and to have a trading tories flourish.

fund operating from April 1974. (Sir) John Mallabar.

Developments since may be 39, Arlington House,

up . . . to see what steps were necessary to implement the main recommendations of that

sittings, the post of Chief executive Dockyards had been created
and a civilian of high calibre
appointed. We recommended
that the post of Admiral
Superintendent (under whose
control the dockyards had previously operated) should be
abolished and that only in exceptional circumstances should
the views of the Area Flag Officer prevail over those of CED.

Note long after we reported,

are exsult of the second report,
was the neviewed by the strong report,
and the Government of the day
decided it would not go for a
trading fund. ... The next
report, that of Mr Speed in 1980
was then examined; it did make
a recommendation for a trading
fund ... and that was then put
into study for implementation
and was overtaken by the and the Government of the day decided it would not go for a trading fund. The next report, that of Mr Speed in 1980 if at all, is ex gratia and entirely at the company's discretion.

a recommendation for a trading fund... and that was then put into study for implementation of the put of the company's discretion.

Even when ex gratia payment is made there is, more often than not, a long period during which interest is not waid. Interest rates vary widely near the company's discretion. We are now over 10 years (and four Prime Ministers) after the date when our committee recommended that a trading fimds should be operating

result, further reports and fur-ther studies on what was the best thing to do in the new circumstances were imple-mented. These took us to midsummer last year, when a new

Meanwhile, the ordnance fac-St James's, SW1.



Common Market in cars

cial Times are seldom anything on the other."
but well-informed and cogently
As a further argued. I regret that cannot be said of "Common Market in cars" which appeared on August 21.

August 21.

It attacks the franchised dealer system in car distribution and servicing and suggests it would be in the consumer's interest for supermarkets to market them "like other consumer durables." Whoever was prescrible for that systemate responsible for that statement

The raison d'etre of the EEC Commission's draft regulation on block exemption for motor vehicle distribution and servicing agreements is the recognition that the motor car is not like other consumer durables. For one thing, public safety is

Indeed, the draft regulation emphasises that the present system is indispensible "because motor vehicles are con-sumer durables which at both regular and irregular intervals require expert maintenance and repair, not always in the same

to an unlimited number of mic circumstances differ as dealers and service stations." widely as they do, and currency It goes on to stress that the exchange rates fit linking of servicing and distribution "must be regarded as Brian Courtenay. more efficient than supporting 201, Great Portland Street, a distribution organisation for W1.

new cars on the one hand, and otor Agents Association a servicing organisation which Sir,—Editorials in the Finan-would also distribute spare parts

As a further argument in sup-port of the franchised system, it points out that before a new vehicle is delivered to the consumer, it has to undergo a tech-nical inspection by the authorised supplying dealer specially equipped to do so.

It is not the consumer who would benefit from dismantling the franchised system on cars— not that there is any likelihood of it happening. It would be opportunist "entrepreneurs" like the present parallel importers who have no investment in service and repair workshops or trained staff and carry no

As for the suggestion that the franchised system impedes San Francisco last month the competition, one need only scan delegates held American flags dealer advertisements in the newspapers to see there is little evidence of impediment.

Although franchised dealers are not responsible for manufacturers' recommended list prices, they have every sym-pathy with the argument that "On grounds of capacity and ality of prices in Europe so long efficiency alone, such a form of as taxes, especially car taxes co-operation cannot be extended and VAT, productivity, econoexchange rates fluctuate as they

World trade in textiles

British Textile Confederation, we firmly intend to expend as the Chairman, British Clothing Industry Association and the President, Knitting Industries'

> Sir,—Your leader on textiles (August 15) overlooks some of the MFA, for example, the the reasons why the GATT ASEAN countries have inmulti fibre arrangement has re-mained in force, and why it will ing exports to the UK from be renewed in 1986.
>
> The MFA is an instrument for
>
> A further point is the lack of

loping countries—their guaran-teed access under the MFA to the markets of the industrialised countries has allowed them to develop trade which otherwise would have gone to the non-industrialised countries. Within

the orderly development of reciprocity to the growing world trade in textiles and market access given by us under clothing. The multilateral disci-pline which it supplies is the study on textile trade high-main defence against a pro-lighted the massive protection liferation of "grey area" of their home markets by most restraints and unpredictable developing countries and NICs.

From the Campaigns Officer, World Development Movement Sir,—The debate about the pros and cons of the multi fibre

in strong support of the suggestion that trading funds should be established both in necessary to implement the case of the established both in main recommendations of that the case of the established both in main recommendations of that the case of the established both in main recommendations of that the case of the established both in main recommendations of that the case of the established both in main recommendations of that the case of the established both in main recommendations of that through its process, people began to believe that perhaps that was not the best way of recommendation was. The solving what the navy required from the dockyards and rapidly implemented. Developments which have since taken place prove how correct the main proposal of our recommendation was. The ROFs have since increased their efficiency and are earning good.

In the case of the dockyards was not going to be profits.

In the case of the dockyards was not main that the main proposal of the low income textile producing countries. Under practical expression of the interpretation that the main proposal of our recommendation was. The Rofelency and are earning good in the MoD . . . and inherests were reluctant to see them put on a commercialised trading fund basis. Shortly before the committee began its sittings, the post of Chief executive Dockyards had been created and a civilian of high calibre appointed. We recommended.

4 should at the very least

ity to pay interest on money due to beneficiaries for every

paid. Interest rates vary widely and, what is more, tax at 30 per cent is deducted at source. How many beneficiaries (often elderly widows) realise that this this tax can often be recouped?

Ing.

There is no uniformity of I continue to quote: "As a practice in this matter and I think there is a clear need for rationalisation and reform. My investigations have alerted me to other shortcomings in insurance, which I must stress on the whole serves the community

Professor Gower in his review Percy Richer.

you reported on August 18, has hit out at the sales hype of many insurance salesmen.

Insurance companies have given overwhelming support to the formation of a new trade body, the Association of British Insurers. Its aim is "to create one powerful representative body that would make an impact on Government, politicians and the public, operated by an effective permanent staff of high-calibre people under a chief executive.

At the end of 1981 there were no less than 98.2m life policies in force, according to the Life Offices Association. Is there not a need for "one powerful representative body" to protect and promote the interests of policy holders?

Terminologically inexact

From Mr H. Bloomer Sir.—Discredit where disment in the person of Mr D. credit is due! Mr Ashworth- Healey, which made that par-Lord's statement (August 22) ticularly unfortunate decision. that it was a Conservative H. F. Bloomer.

Government which cancelled 25-28 Old Burlington Street, terminologically W1.

inexact. It was a Labour Govern

POLITICS TODAY

For Republican, read Tory

By Malcolm Rutherford in New Orleans



President Reagan, accepting the Republican nomination for a second term, in Dallas last week

for Clem Attlee. Hugh Gaitskell and possibly even James Callaghan. It was only Michael Foot and his younger counter-part, Neil Kinnock, who took Labour_out of the mainstream,

By now, they have also succeeded in taking the political as the Tories say today. ground to the right with them. There is a note of defection It was notable that at the Democratic Party convention in in the air, too, though not to a third party. Some relatively obscure state politicians have already switched straight from Democrat to Republican. President Reagan is appealing to Something similar has happened in Britain, Dr David other closet supporters to come

Owen, for the Social Democrats, over to the party of opportunity. has said that patriotism is not the monopoly of the Tories and One who probably will not is Mrs Jeane Kirkpatrick, the U.S. Ambassador to the United Nations. Mrs Kirkpatrick is a Mr Neil Kinnock has been echoing his thoughts for the Labour Party.

Even on welfare, America's
Democrats now admit that the Democrat. She says that in domestic politics she is still a welfare liberal. But she can system cannot go on as before, represent a Republican adminis-It must be more selective. The tration on foreign policy bewhole philosophy of Roosevelt's cause she thinks it is the sole legatee of the post-war aims of New Deal is under challenge,

President Truman and General Marshall. There is some familiar re-writing of political history. The Republicans say that it is not Dr Owen will not like the so much they who have changed. It is, rather, that the Democrats have abandoned old comparison, but his own firm defence of what Labour foreign policy used to be has a lot in common with the way Mrs Kirk-At the Republican Conven-tion in Dallas last week, FDR has no interest in defecting yet, was proclaimed as an American but if ever she wanted to be in hero. So was Harry Truman, line for the Republican succeswas proclaimed as an American hero. So was Harry Truman, and, at times, even J. F. Kennedy. The Democrats, it was sion, she could do it.

To revert, however, to the Republicans and the Tories. Carter and Walter Mondale. The similarities in the pro-it sounded like the Tories grammes are uncanny. They is also a marked convergence in pouring out their admiration have the same heroes, princi-attitudes to new technology.

pally Hayek. The themes are interchangeable: extension of home ownership, reforming the nation's schools to give more power to the parents, enter-prise zones, reduction of bureaucracy, and reducing

held out as an example of the country's renewed decisiveness in foreign affairs, and as an implicit justification for U.S. Administration's concern about that area. The Republican platform notes: "El Salvador is nearer to Texas than Texas is to

New England," which is one way of saying that the old East Coast establishment no longer controls America, just as the old establishment no longer con-

bureaucracy, and reducing public expenditure as a per-centage of GNP.

Where Mrs Thatcher had a Falklands factor, the Repulicans think they have a Grenada factor. The American intervention in that island is repeatedly played the same role to Mr. action in other parts of the a right-wing chief. He may Caribbean and Central America. have kept the liberal option It is necessary to come here to open, appreciate the full extent of the Mr John Biffen remarked

trols the Tory Party.

Mrs Thatcher and Mr Reagan are again at one in their aim to turn the country round. The Prime Minister always said that she would need a second, possibly even a third, term. The need to complete the unfinished agenda. They meet not only in their attempt to re-establish

Here, government interven-tion is totally in order, Indeed, it seems to be an Anglo-American conservative common creed that, without more public investment in research and development, economic growth will come to a standstill. The Tories and Republicans have taken over as the promoters of high tech, even Mrs Thatcher has not been as public about it as she might have been. Labour and the Democratic Party are condemned alike (or seeking to protect old jobs and an old way of life. The conservatives in both countries have become the radicals, while Labour and the

Democrals have become the conservatives.

There is a final parallel between Mrs Thatcher's Tories and President Reagan's Republicans, Both parties are now involved in the struggle for the eventual succession, and it concerns more than personalities. The concept of wets and dries does not exist in America. Instead Republicans talk about them selves as conservatives, moderates, or liberals. But the divisions are much the same. Mrs Thatcher has not quite eliminated the wets in the Tory tradition, as Mr Francis Pym demonstrated in his recent book. Nor have the moderates

played the same role to Mr Reagan as the then Mr Whitelaw did to Mrs Thatcher in her first term: a moderate who has been utterly loyal to a right-wing chief. He may

after the last British general election that it was no longer a battle between wet and dry, but between the radicals in the party and the consolidators. That is probably the question for the Republicans next time. There is a group of young hawks who would like to push the party ever rightwards, using the methods — such as control of the manifesto—by which the Far Left tried to take over the Lebour Party. But it is not yet certain that Mr Reagan will encourage them. President talks now about the He might even go for a major arms treaty with the Soviet Union, which would upset them a great deal.

The President and Mrs Thatcher could turn out to be consolidators in the end.

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Accounts, 23rd Aug. 1984. Abbey National pays interest net of basic rate tax and the gross equivalent is

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FINANCIAL TIMES

Tuesday August 28 1984



Terry Byland on Wall Street

Turbulent time for airlines

STOCKS of U.S. demestic sixting companies have the unenviable distinction of having underperformed against a rocketing equity market over three exciting weeks on Wall

After a brief surge which lifted some to within hailing distance of their 52-week peaks, prices turned back, and UAL (United Airlines). AA (American Airlines) and TWA are now below their early-August

The upset was caused first by the fear, and then the reality, of a return to fare-cutting on domestic routes, which plagued the industry

and its profits a few years ago. Nervousness on this point was sufficiently disturbing to outweigh the benefits to stock prices of weak-ness in the price of fuel, the major

cost factor for airlines.

The stock market's worries came to a head when People Express, the latest and sharpest of the price-cutters, announced that it was moving in on the lucrative East Coast to Chicago routes. These were worth about \$716m in passen-ger revenues to the industry last year, or nearly 2 per cent of total

People Express started the combut among the airlines this month when it commerced its Newark to Chicago service, with five flights

The New York area to Chicago routes alone carried 3.6m passer gers last year. The other major routes involved are those between Baltimore and Washington DC.

Dr Julius Maldutis, who covers the airline industry for Salomoi Bros, comments that the battle for the East Coast to Chicago market will fall largely on AA, UAL and TWA - with Capitol and Midway, two of the smaller carriers, also fac-

People Express.
The latest statistics from the Civil Aviation Board (CAB) show that AA had 34.3 per cent of the Chicago to New York traffic, and 38.4 per cent of the traffic on the Boston to Chicago route, which is the second in importance of the group. UAL had 39.5 per cent and 48.4 per cent respectively, and TWA 13 per cent

has risen by about 23 per cent since the end of July, compared with a gain of 11 per cent in the Standard and Poor's 400 stock index.

AA, which was 15 per cent up early this month, now shows a gain of only about 2.8 per cent. The same trend has been followed by the other leading players in the East Coast

It could be that the stock market is oversimplifying the situation. The growth pace of the East Coast to Chicago route is still strongly outperforming that of the industry as a whole. This will nelp the strong competitors to handle the new competition. In 1983 traffic on these routes expanded by 14.4 per cent, according to the CAB, against only 6.3 per cent for the industry overall.

Dr Malduts believes that the en-

try of People Express will not seriously affect the market share of either AA or UAL. The other carriers will take the brunt of the new competition, which could force them either to the margin or possibly out of this market altogether. This must include TWA, which

held a 28.2 per cent stake in the East Coast to Chicago traffic as recently as 1978, but now has only 13 per cent. Its retreat has been particularly rapid on the New York routes, where its share had dipped from 28 per cent to 13 per cent over five years, and on the Boston route where it has fallen from \$1.6 per cent to a meagre 6 per cent.

The stock market has already be gun to reflect the new threat to TWA's East Coast to Chicago business. The stock, which jumped 16 per cent at the beginning of August, has been underperforming since then and now shows only a small gain over the period which has seen ndustrial stocks surging ahead.

Probably a greater risk is the market share of Capitol Air, which entered the New York to Chicago battle only three years ago and has a 4.5 per cent stake, and of Midway Aurlines, also a recent entrant. which now has 4.3 per cent of the New York traffic, 9.4 per cent of the Philadelphia route and 8.9 per cent of the Washington traffic.

Since deregulation of the industry, the major U.S. carriers have learned to live with increased competition and with fare-cutting by brash newcomers.

People Express has just announced a move into the Newark to Miami and Newark to Detroit markets. While airline yields will certainly be affected by further price competition, the major carriers will fight to delend their business. It may be that Wall Street is ex-

aggerating its own fears. Only the weakest need go to the wall.

Banks see progress in talks on Mexican debt

BY MARGARET HUGHES IN LONDON

advisory committee made "substantial" progress in negotiations over the weekend towards a multi-year rescheduling of the country's public sector debt, Mr William R. Rhodes, vice-chairman of Citibank and co-

Detailed proposals of the terms and conditions of the rescheduling are expected to be circulated to Mexico's 500 creditor banks early next month, but no date has yet been set for reconvening the talks between Mexico and the creditor

A multi-year rescheduling of Mexico's debt would represent a major breakthrough towards achieving a solution to the repaytowards ment problems of Latin American countries which collectively owe \$350bp to their foreign creditors.

Mexico had earlier proposed a 15year rescheduling of all public sec-tor debt falling due between the end of this year and 1990. This would

MEXICO AND its 13 member bank amount to \$48bn, more than half in 1988 or beyond the present IMF Mexico's total foreign debt of \$87bn. Mexico also wanted to include

within the package some of the debt which has already been rescheduled under earlier agreements with the creditor banks as well as the

In addition, Mexico has asked for a commitment from the banks to lend new funds if there is a significant increase in interest rates.

Mexico has been promised better rescheduling terms by Mr Jacques de Larosiere, managing director of the International Monetary Fund, in return for its progress in adjusting its economy, a promise which was supported by Western governments at this year's London sum-

The commercial banks, however, have been reluctant to agree a reyond the term of office of President Miguel de la Madrid, which expires

programme which ends next year. Mexico has said it sees no need for a further IMF programme but the Fund has been reluctant to as sume responsibility for monitoring a country's economic performance vhere it has no programme in

creditor banks have reconciled this problem. One possibility is that Mexico would submit reports on its economic performance for authentication by the IMF. This would not

structuring, Mexico is seeking a reduction in interest rates below the present margins which average 1% so wants banks to drop their option to base their interest rates on the more expensive U.S. prime rate, and to drop their normal reschedul ing fee, which could be as much as

Ford to open third U.S. outlet to sell luxury European imports

BY KENNETH GOODING, MOTOR INDUSTRY CORRESPONDENT, IN DETROIT FORD is to build a third car fran- and we intend there should be con-

hise in the U.S. which will sell high-priced models imported from in Europe, with distinctive differences from our American products.

ago that it would begin sales this built Sierra XR4i to be sold as a "Mekur" in the U.S.

tinuity. We build cars of real merit With relatively low investment, we

Mr Donald Petersen, Ford's presiMr Donald Petersen, Ford's presiand that limits volume," Mr Petersdent, made clear yesterday that this was the first step to establish a new the various European companies Mekur franchise in the U.S. separate from the Ford and the Lincolnus we have a similar opportunity."

"The introduction of the Mekur about what might follow the Sierra, the autumn. Sales might reach was not something we did lightly, but the logical choice would be a 60,000 to 100,000 a year.

due early next year in Europe and by all accounts somewhat similar in that Ford has been preparing the new Granada - which will be built only in West Germany - to pass technical tests in the U.S.

The American Sierra-Mekur will be powered by a turbocharged 2.3 litre engine, made in Brazil, rather than a European unit.

new franchise have been told the Mr Petersen would not be drawn \$17,000 when the car goes on sale in

Jaguar demand creates jobs

BY DOMINIC LAWSON IN LONDON

U.S. and West Germany. West German demand for the

cars so far this year is 65 per cent up on the same period in 1983. A to-tal of 1,100 Jaguars has been sold the year, compared with 1,220 in the whole of last year. In the U.S. more than 10,200 cars

have been sold so far this year, an increase of 16 per cent over the comparable period of 1983, Jaguar has not cut its U.S. selling price in an attempt to exploit the weakness in the sterling dollar exchange rate. so the company feels confident that it is creating the new jobs on a day that it did not believe in taking sound long-term basis.

JAGUAR, the British luxury car manufacturer, is to create 530 jobs advantage of the overwhelming in an effort to meet a rapid increase sales demand in the U.S. and Germantain our policies of offering se-

Jaguar made pre-tax profits of £55m (\$71.9m) in 1983, and a further £43m in the first six months of this year. Shares in the former part of state-owned British Leyland, which were offered to private investors earlier this month, were eight times oversubscribed. The share price ended the week on the London Stock Exchange at 171p, above the 185p at which they were sold by the

Last year the company sold 28,000 cars, but it expects to sell about 32,000 in 1984.

on new staff unless it could give Mr John Egan, Jaguar's chief ex-them secure employment for at ecutive, said yesterday that by in-least two to three years. Mr Egan

cure long-term employment and continuing to increase our produc-

In 1980 Jaguar turned out 1.4 cars a worker a year. This year it has been producing 3.5 cars a worker a year, and next year it projects a fur-ther increase to 3.7, even after the increase in the workforce.

Recruitment will start immediately for the jobs, of which 320 are to be at the Browns Lane assembly plant in Coventry, the Midlands. Another 160 men are to be taken on at the Radford engine and axle plant, also in Coventry. The remain-ing 50 are to be located at the Castle Bromwich body assembly and paint plant in Birmingham, also in the Midlands.

Zanussi pact sought

Continued from Page 1

alternatives would aim at the same objectives as before.

rifice and we have to stick to that, but there are possibilities to arrange the sacrifice in different ways."
The group of 80 Italian banks which hold the bulk of Zanussi's to-

tal gross debt of L1,046bn (\$582m) have agreed to reschedule their loans over the next seven years and to reduce interest rates, a sacrifice of about L200bn. Mr Ribohn agreed that the deal was still uncertain. "If we don't get agreement I don't know what will

appen," he said.

Amid the continuing uncertainty

the weekend to shore up waning business confidence in Zanussi by signing a conditional agreement

with the Zanussi family and the Italian consortium led by Medio-banca for its acquisition of a 49 per cent stake in Zanussi. The agreement is still conditional

on other parties, chiefly the foreign agreeing to the final terms of the Under the deal signed at the

weekend Electrolux would pay about SKr 150m (\$18m) for the existing equity - recently written down - to the Zanussi family and the other major shareholder, Voest Alpine of Austria. Some L100bn would be injected

in new equity - 47 per cent by Elec-trolux and the remainder by the Mediobanca consortium which includes Fiat and other Italian inves-

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threat of retaliation in foreign coun-Foreign companies and governments, especially in Britain and Ja-

pan, have actively campaigned for a change in the California tax sys-tem. Mr George Deukmejian, the state governor, announced in May proposals to amend the tax code which would significantly modify unitary tax. The Governor forgot his friends closer to home, however, claim the Silicon Valley companies.

where foreign companies are treated better by local governments than home grown firms," Dr Moore said. The Bills would "compromise our ability to compete, to grow and to employ more Californians."

negative factor against California if the proposed legislation passes," Mr Michael Mayback, Intel spokesman, said. "I am not suggesting that Intel or any of the larger companies will move out of the state, but small companies - tomorrow's Intels -will have to look closely at whether it is worth staving."

Company representatives admit ted to being "stunned" by the swift should be re-awarded in the second passage by the State Senate this month of two Bills dealing with un-itary tax, after six years of lobbying three years with the project, Davy, efforts had failed to achieve as Procofrance and Technip are

Unitary tax move resisted in California

The intent of the legislation was not to benefit one group of compa-nies over another, she said, but to make California more attractive to

"I know of no other instance "Unitary tax will become another

> Tore is now looking for responses The contract, all being well,

Baving already spent more than

Belgium and UK seek air fares cut

By Ivo Dawnay in Brussels TALKS between British and Bel gian transport ministry officials are expected to begin this week, aim at introducing cheap air fares be tween the two countries.

ushered in a £49 (\$64) return fare on London-Amsterdam flights, with extensive reciprocal liberalisation of rights for the two countries' air

similar package, not least to counter the effects of cheap price fares from the UK to its near neighbour. Herr Karl-Heinz Neumeister, sec retary-general of the Association of European Airlines disclosed Britain's interest in negotiating a cheap fares deal. He said the UK had

Herr Neumeister, whose 20-airline association supports the drive for cheap fares, said he believed any agreement reached could be implemented well before next Janu-

asked for a meeting with Belgian transport officials by the end of the

ish Government and the Netherlands to implement the £49 return fare, and I do not expect it will take

the Belgian Government any longer to agree," he said. UK Transport Ministry officials could not formally confirm that a request for talks had been made However, it is understood that Mr Nicholas Ridley, UK Transport Minister, has indicated a wish to press ahead with fare and other re-forms after the agreement with the

Michael Donne, Aerospace Cor-espondent in London, writes: Conresponses in Education, writes: Con-corde is now paying its way in the British Airways' fleet "and is contributing to the airline's turn-round with steady profits," accord-ing to Captain Brian Walpole, BA's Captain Manager Concorde No fig. General Manager, Concorde. No fig-ure is given, but it is believed to be several million pounds a year. BA has six supersonic Concordes in service, and a seventh is being

brought up to full flying standard to join the fleet next year.

Aerospace survey, Section III

Thais plan refinery expansion

By Peter Bruce in London

THE THAI Government has launched an international advertising campaign in an effort to encour-age new bids to double capacity at the Thai Oil Refining Company (Torc) refinery near Bangkok. The bids could reach \$500m. Torc, which is 49 per cent-owned

thority, first awarded in April 1982 a \$452m contract to expand capacity at the refinery from 85,000 to 110,000 barrels a day to a consor-tium led by Britain's Davy McKee, and two French partners, Proco-france and Technip but withdrew it last month after months of arguing

over financing.
The contract was the biggest ever awarded to a British company in Thailand. But while Torc's advertisements insist that "the contracto will also be required to arrange the finance" it is highly unlikely that the Thais, in return, will be prepared to guarantee much, if any, of the loan capital raised.

Worried about the state of world oil markets, and hence the project's ou markets, and hence the projects viability. Barclays International and Société Générale of France, the Davy consortium's original bankers, began to apply pressure list year for some form of guarantee from the Thais. This culminated in the collapse of talks between the Thais and the bankers and contractors in London last November. Mr Ob Vasuratna, the Thai Indus-

new tenders but the British and French governments stepped in with offers of grants, soft loans and buyer credits. Barclays International and Société Générale took a back Morgan Grenfell, London merchant bankers, and Banque Indosuez, into •be negotiations.

to the bidding by September 5, and project managers, U.S.-owned Fos-ter Wheeler, who are running the project through their UK subsidiary, believe they will be ready to put together a shortlist of approved bidders in about two months.

THE LEX COLUMN

The clock stops on deregulation

night from U.S. frontier towns a century ago helped to establish a suspicion of banking which has been perceptible in the U.S. almost ever since. It was heavily but-tressed by the bank collapses of the Depression era and the Glass-Stea-gall legislation of 1933 has been its lasting monument. For much of the last decade, this suspicion has been overcome by the successful advo-cates of banking deregulation; but proponents of continued reform

steadily less receptive audience.
Within a few weeks of the rescue nancial system is confronted with an impending liquidity crisis in an-other institution with assets more or less the same size, as it happens, as those of the crippled Chicago bank. The problems of Financial Corporation of America (FCA) are rather different from those of Continental Illinois and could still prove less than disastrous with a bit of help from conditions in the U.S. noney market. But there is no doubting the widespread alarm at FCA's present predicament, underlining again the urgency of the debate about regulation across the whole U.S. financial sector.

Rates squeeze

shared by the bulk of its competitors in the U.S. savings and loan in dustry. The larger S & L companies - including most of those which are publicly quoted - had a comfortable first quarter and have only been squeezed by the rise in short-term rates since May. Even now, their situation is not as bad as it was in

prompted second thoughts about re-

of these - namely, clearance for S &L companies to switch to adjust-able-rate mortgages in place of the fixed-rate assets, which proved so

All that said, FCA is one of the most celebrated products of nearly 10 years of deregulation. For nearly half a century, Regulation Q imed interest-rate ceilings imposed by the Glass-Steagall Acts. In the wake of its removal and because of competitive rates and aggressive marketing of "jumbo" deposits and wholesale funds - neither is available to it under the ancien régime - FCA has made itself the largest S& L holding company in the U.S. within the space of a few years.

It has also, given a bad press and a savage mauling from the SEC, made itself into the biggest head-ache currently afflicting the U.S. gument for significant changes in pension funds and this could be an-the regulatory environment will be other area for scrutiny.

short-term funding has been well aired; but the gravity of its immediate liquidity problem may still have tralised management of cash as-been underestimated. Having sets, are surely irreversible, as in turned over \$19.9bn of short-term li-the U.S. airline industry, where abilities just last month, it could they have brought about buge ben-now be faced with refunding as effits. To maintain the safety record much as \$500m of its liabilities every business day - not to mention a might now be thought necessary a

of long-term fixed-rate assets and

Bankers who fied quietly in the duced specifically for its own indus-ight from U.S. frontier towns a try. Indeed, quite the opposite. FCA wall Street is acutely nervous of a entury ago helped to establish a set its face against the most notable serious run on its retail deposits and the company's access to assis-tance from the Federal Home Loan Bank – which in theory could run to several billion dollars on top of perdebilitating three years ago - and it haps the \$20n already borrowed - is this decision as much as any othseems vulnerable to mounting criticism from the rest of the S & L in-

Likely trigger

A much beavier involvement for the Home Loan Bank could presumably be made conditional upon sweeping changes in FCA's man-agement and operations. This now appears the most likely trigger for any near-term moves on the regula-tory front. It is conspicuous, for example, that some features of FCA's rapid expansion - such as its pur-chase and recent sale of shares in American Express - have only been possible because it is a state-chart-ered S&L rather than a Federalchartered company like most of its money markets. And if this should competitors. Again, tighter restricturn out to be the first symptom of tions on the Federal insurance another financial debacle on the cover available on S&L deposits scale of Continental Illinois, the ar- may have curtailed FCA's access to

The awesome scale of FCA's cal- adjustments as these for the wider culated gamble on its mismatching regulatory environment is harder to predict. The fundamental changes wrought by deregulation, including a whole new market devoted to cenheavy burden of fresh property the very least to review the brief of loans to which it was committed at the various Federal insurance agenthe end of June. Unlike Continental cies and perhaps to demand of Illinois, FCA is not solely reliant on them a more active watchdog role.



air environment, good communications and the best possible financial package: finding all this in one location meant it had to be Clwyd 59 Derek Cross General Manager, Optical Fibres.

Optical Fibres make light of communication in more ways than one. As a company they are dedicated to the volume production of high quality, low loss optical fibres for all commu

munication network. Being only 2 miles from the start of the M56 and the national motorway network, means that they can reach around 60% of the UK population in just 4 lorry hours. Other factors that convincedOptical Fibres and many

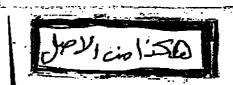
other companies that Clwyd was right for them include:-Financial aid equal to the best in mainland G.B. *A reliable, trainable and co-operative workforce.

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SECTION II - COMPANIES AND MARKETS

FINANCIAL TIMES

Tuesday August 28 1984



HONG KONG BORROWING

First local floater soon for Mass Transit Railway

BY DAVID DODWELL IN HONG KONG

WITHIN the coming month, Hong Kong's Mass Transit Railway Corting to about HK\$5bn, is not withporation (MTRC) will unveil details of a HK3500m (\$63.8m) floating-rate note being arranged by Morgan Guaranty and Manufacturers Hanover. It will be yet another "first" for the territory's biggest borrower. We bave pioneered new kinds of borrowing and have been aggressive borrowers," Mr Lau Wah Sum, the MTRC's outgoing finance director, said. "We are proud of this - not because we like owing people money, but because it means we've been able to borrow more cheaply." During the past year, the MTRC has mounted Hong Kong's first

Major MTRC loans concluded sin-de August 1983

Banque Paribes Indosuez Asia Midiand/Crocker LTCB Tokal/liftsui Bank of Nova Scotia Puji Benk First Canac First Nat Bank of Boston 300m 800m U.S.\$ Berclays Asia

Extended from original HK\$300 m loan

bond issue and the territory's first U.S. dollar-denominated commercial rate note as part of a borrowing HK\$5bn. Gross borrowings for the nine year-old corporation add up to

out its detractors, however. Many feel it was rash to go ahead with its third railway line - the Island Line, due to be completed in the middle of next year - once the local proper-

ty market collapsed in 1982. They have argued that a corpora tion with relatively fixed future income, and fixed overheads, will be unable to repay the debts incurred and will be forced to turn to the Government for fresh funding. It will be the Hong Kong taxpayer who will ultimately pick up the bill,

they say.
In 1983, the MTRC made a loss before extraordinary items of HK\$535m due entirely to interest and finance charges of HK\$788m on its borrowings. Losses are expected to mount, peaking around 1986.

It has additionally been hit by foreign exchange translation costs amounting to almost HK\$900m. Losses so far have eroded the Hong Kong Government's investment to about HK\$3bn. Yet the MTRC maintains the highest possible credit rating among international lenders, who no longer insist on government guarantees, and are now offering loans at between % and ¼ a percentage point above the London Interbank Offered Rate (Li-

bor). This compares with margins

of 21/2 points when the corporation first turned to the international cap-

ital markets.

One prominent banker in Hong Kong explained: "If you look only at the current cash-flow, then obviously it can't pay its debts. But banks are looking to the future, and the programme which has garnered are looking to the future, and the commitments amounting to almost fact that there will be no other means of transport in the territory that can overtake it. They also have HK\$15.5bn; and are likely to peak in 1986 at about HK\$22hn.

The corporation, wholly owned by the Hong Kong Government is, after all, basically ungeared."

Changes in U.S. bond rules stir uncertainty

BHF Bank bond average

1984

YET AGAIN the Eurodollar bond market has cause to mutter darkly about the U.S. Treasury. Its new regulations covering U.S. issuers' bonds sold overseas, published last Monday, only increased the uncer-

The regulations seem to say that whoever pays the interest outside the U.S. on a corporate bearer bond issues have virtually dried up with must have written proof that the only one, from a Japanese borrowecipient is not a U.S. person or else it will have to levy a 20 per cent There have been floaters and zer-"back-up" withholding tax. That os aplenty, though. Even U.S. borwould be enough to stop investors buying the bonds.

Dealers are anxious that the Treasury sort it all out before re-cent deals for Texaco, Mellon Bank zeros, of course, do not have any inand Beatrice are closed. Otherwise terest to pay tax on.
they might have to be cancelled. The Canadian dollar sector has they might have to be cancelled. The unkinder traders say that would not be a bad thing in Beatrice's case, where some suffered discount.

bringing a fixed rate issue for a U.S. sell.

there are lower than in the U.S. In the Eurodollar market, last fies the rules. As a result straight

There have been floaters and zerrowers can issue these floaters beand institutions who do not worry

98,056

sprung to life again - with coupons a good point lower than they were six weeks ago. The market is allosses, as the price slid to a 5 point most entirely dependent on retail

company Trizec looked a little ag-gressive. The borrower has a U.S dollar with a 16 per cent coupon which is traded at 100%, so a 13 per cent yield looks low. But the domes tic Canadian bond market has rallied well this summer and yields

week's issue from Secom is already trading at 102%. In D-Mark, the Rhythm Watch bond with warrants has shot up to 104, while the Nitto Boseki convertible is just below cause they are mainly sold to banks par. And in the Swiss franc market recent convertible private place-ments have all been fixed with lower-than-indicated coupons.

The continental markets are taking heart from the slight weakening of the dollar, and the more stable New York bond market. D-Mark bonds gained around % point over rice's case, where some suffered six weeks ago. The market is almost entirely dependent on retail most entirely dependent on retail buyers, largely continental, and new issue managers will not risk.

New issue managers will not risk new issues are generally slow to new issues are generally slow t

Mexico talks provide cause for optimism

PROGRESS TOWARD a multi-year rescheduling agreement between Mexico and its creditor banks over the weekend could represent a major breakthrough towards achieving a long-term solution to the Latin American debt crisis. The Mexican package may set a precedent which could be followed by other countries such as Brazil and Chile, seeking to extend the term of their rescheduling beyond that of their existing international Monetary Fund (IMF) programme and for Venezuela which has resolutely rejected an

IMF programme. There appears already to have been some closing of the gap between Venezuela and its creditor banks, which resumed negotiations last week. Venezuela has apparently been persuaded to abandon the principle of six annual payments. Venezuela has also become more

per prices which took the London Indonesia came to the market last Metal Exchange price up to its highest level in May should take some of the pressure off Chile. which is attempting to renegotiate its economic targets with the IMF. Chile based its economic projecthan on its previous \$750m loan.

tions for this year on an average copper price of 75 cents a pound only to see prices slump. Copper represents more than half of its export earnings and about half of these go on servicing its debt, the burden of which has increased with the rise in interest rates. If sustained, the rise in copper

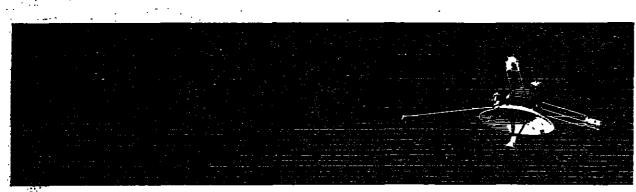
prices should ease the pressure on Chile and make accommodation with the IMF easier. Chile has al-ready drawn SDR 400m (\$407.4m) of its SDR 500m IMF facility due this year but still has some \$380m outstanding on its \$780m commercial bank loan, which is dependent on an IMF programme remaining

Meanwhile, the sharp rise in cop-centred on Asia and the Far East. week for its second major fund raising this year with a \$500m dualtranche credit in yen and Eurodol-lars on terms which are a little finer

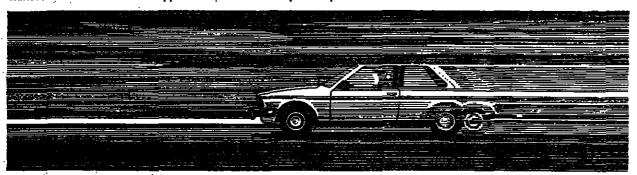
> Nalco, India's state-owned aluminium company, is trying to get better terms on its \$300m loan, particularly the tax-spared portion. On the sterling front, Co-opera-tive Retail Services, the UK's largest co-operative society, has awarded the mandate for a £30m seven-year advance acceptance fa-

cility to BankAmerica Capital Markets Group and Co-operative Bank. Meanwhile, Britain has followed the lead of its European neighbours in renegotiating better terms for existing loans. Last week the Electricity Council became the first UK borrower to do so. Although the authorities state that there has been no deliberate change in policy, other nationalised industries may well on the lending front, interest has follow.

<u> </u>		NEW INTERNATIONAL BOND ISSUES													
Borrowers	Amount Th.	Materity	Av. life years	Cospon	Price	Lead Manager	Offer yield	Borrowers	Amount 16.	Maturity	Av. life years	Coupon e/p	Price	Land Menoger	Offer yield 40
U.S. DOLLARS								SWISS FRANCS							
Optec Dai-leti Denka 5‡	30 58 58	1999	15	374	190	Yamaichi Inti.	3.750	Mitzebishi Plastics **\$‡	60 80	1989	-	21/4 51/2	709 100	SBC CS	2.258
Konishiraka Piesto Ind. Ї	59	1999	15 5	4	188	Militim Secs. (Europe)	4.890	Cie. Française des Patroles ‡ Konishiroku Photo Ind. **§‡	50 50	1 994 1989	_	21/g	100	SBC	5.875 2.125
Toboka Electric ‡	56	1989	5	124	189	Nomura Intl., Selomon Bros., Yasuda Tst. Eur.	12,750	Mitsui OSK Lines **1	100	1985	_	6	199	SBC	5.000
Elec. de France I	500	1994	10		32.25	Morgen Gueranty, BMP,	12130	Asabi Pen **§	20	1985	_	25/2	180	Bque. Morgan Grenfell en Suisse	0.000
contract to	300	1934	10	•	32.23	Nanura Intl.	12,428	Karierote Iron Works **	30	1989	_	6	180 100 100	EŠ	•
Mordic leust, Bank 1	· 150	1994	18	8	31.75	Morgan Guaranty, Paribas,		Nagoya Raikoud **¶	50	1989	-	4%	100	CS UBS SBC	-
,						Daiwa Europe	12. t <i>5</i> 0	JFM	190	1954	-	•	•	SBC	5.750
EFCE †‡	608	1999	15	1/8	108	CSFB, BNP	-	•							
Related 7.1	380	1999	15	¥is	198	Deutsche Bank, CSFB, BNP, Orion Royal, SG Warburg									
Korea Exchange Bk. 11	125	1999	15	₩	199	Mergan Gearanty, Bk. of Tokyo	- Inst	•							
Riggs National †(b)‡	56	1995	12	74	180	Morgan Stanley, Parihas, Salo		ECUs							
Secont §	125 58 79	1999	15 12 15	4	180	Noceure Intl.	•	ECSC ‡	40	1989	5	103/4	106	Soc. Gen. de Bque., BBL,	40.750
CAHADIAN DOLLAR								ECSC t	40	1994	10	111/4	108	Kredietbank As above	10.758 11.250
City of Winnipsy I	58	1991	7	123/4	993/4	Wood Guady	12.896								
Trizec Corp. Casada ‡	50	1989	5	13	108	CIBC	13.009								
D-MARKS			•												
Rantamatki Oy 🕽	100	1991	7	8	100	Commerchank	8,000	YEN	•						
ESCOM 1	108	1992	. 8	81/4	180	Commerzbank	8.258	Theiland ‡	18hn	1991	6.4	7.7	99.65	Nikko Secs.	7.917
Rhythm Watch ¶	68	1989	5	5 ·	190	Dresdaer Bank	•	Charbs, de France **‡	1 Disa	. 1994	9	7.8 7.9	100 100	Yamaichi Secs.	8.056
Mitte Beselú §		1989	5	3¾	109	Deutsche Bank		ICIC‡		1991	6.4	1.5	100	Daiwa Secs.	8.956
* Not yet priced.	1 Final terms.	" Place	econt.	∮ Cep	vertible.	† Floating rate note: comp	on is spread o	ever 6-month Libor (b)	Spread over 3-s	eath Liber.	9	With warran	nts.	Note: Yields are calculated on A	IBO basis.
	-					-	-								



TRW is a widely diversified company on the leading edge of electronics and space technology. Our Pioneer 10 spacecraft (pictured) was the first man-made object to leave the solar system. And TRW electronic components have hundreds of down-to-earth applications - from computer tape drives to television sets.



TRW began as an automotive parts manufacturer over 80 years ago. Today, almost every car and truck on the road contains TRW parts. TRW factories around the globe produce a wide range of automotive parts - from bearings and valves to complete rack and pinion steering systems.



TRW industrial and energy products have earned a reputation for reliable performance. TRW equipment, backed up by an extensive field service and repair network, helps pump oil and gas around the world. TRW components keep the world's aircraft flying; and TRW bearings, tools, and fasteners help raise productivity levels worldwide.



These Bonds having been sold outside the Netherlands Antilles and Australia.

August 1984

NORDFINANZ-BANK ZÜRICH

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Armand von Ernst & Cie AG

et de Lorraine Fuji Bank (Schweiz) AG

NEWSCORP NETHERLANDS ANTILLES N.V.

Willemstad, Curação, Netherlands Antilles

6%% Bonds 1984-1994

with the guarantee of

THE NEWS CORPORATION LIMITED (Incorporated with limited liability in the State of South Australia)

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Bank Oppenheim Pierson (Schweiz) AG Boldman Sachs Finanz AG

Benca del Sempione Bank Leumi le-Israël (Schweiz) Banque Keyser Ullmann S.A. Banque de Participations et de Piscem Banque Nationale de París (Suisse) SA BHF Bank (Schweiz) AG Crédit des Bergues Dai-Ichi Kengyo Bank (Schweiz) AG Grindlays Bank Pic Hottinger & Cie

Hottinger & Cie Inter Maritime Bank Mitsui Finanz (Schweiz) AG Phibrobenk AG

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CIBC Finanz AG Great Pacific Capital S.A. Indelsfinanz Midland Bank Ink of Japan (Schweiz) AG LTCB (Schweiz) AG

va Lorraine Va Finanz (Schweiz) AG Va Finanz (Schweiz) AG Va Finanz (Schweiz) AG Volted Overseas Bank Volksbank Williseu AG New Japan Securities (Schweiz) AG Sanwa Finanz (Schweiz) AG

Financial Advisor to Newscorp Netherlands Antilles N.V. and to The News Corporation Limited: ALLEN & CO. INCORPORATED,

Swiss Francs 150 000 000

FOMC report dulls prospects of early easing moves

THE FUTURE performance of slowing and most economists the U.S. credit and money markets hangs in the balance—as the economic, moneyary, indicators due out tomorrow. and political debates which so Against this background bond markedly influence market prices were barely changed last

nood.

Last week, with the recent rally apparently rapidly running out of steam, bond prices bounced around in summerthin trading and closed incompanies.

prices were barely changed last week. The Treasury 12.5 per cent long bond closed on Friday at 100½, a ½ point drop on the week, to yield 12.44 per cent.

Several analysis.

showed nothing terribly unex-pected. The FOMC despite the lone objections of Mr Preston Martin, the FED vice chairman, agreed to hold the line with a basically unchanged "even basically unchanged even keel" monetary stance—per-haps still displaying a slight bias towards firming. The target ranges for the three major money supply measures, M1, M2 and M3 were

U.S. INTEREST RATES (%)

Week to Week to Aug 24 Aug 17

Fed funds wkly av ... 11.71

Three-month CDs 11.45

Three-month T-bills ... 10.48

30-yr ins bind (Aug 18) 12.46

AAA utility (new) ... 13.50

AA industrial 13.38

Source: Salomon Bros. (astimutes).

Maney supply: In the week ended August 13 M1 fell by \$1.2bn to . \$546.1bn.

marginally lowered for the June to September period but most market participants read little into this, noting that the unexpected \$1.2bn decline in M1 last week leaves the basic 2 points. money supply measure below Among

Likewise, the slight upward adjustment of the Federal

Thus the report contained few surprises but nevertheless appeared to dull the prospects for any early easing move—as some Wall Street economists. corporate treasurers along the maturity spectrum. Interesthad begun to tentatively suggest was on the cards. There is a general consensus

that the pace of economic expansion in the U.S. is now

is spending \$500m to \$600m a address at the Automotive News year to buy cars and com- world congress, said AMC ponents from Renault, its expects to sell at least 210,000 associate in France, and expects cars in the U.S. this year, up a steady increase in this type from 193,000 in 1983, and Jeep of business.

Mr Paul Tippett, AMC chair- 150,000, following the introducman, said yesterday his com-tion of new lighter-weight pany was two years into a models. \$1.7bn investment programme, and as new products emerged and sales built up, Renault would supply more components engines and transmissions in

For example, a 2.2 litre Renault diesel will soon be introduced to the new AMC Jeep in the U.S., the first time a diesel engine has been offered

Saudi builder

calls in New

York adviser

some 80 lending banks to meet Shobokshi's immediate work-

ing capital needs and restruc-ture its medium- and long-term debt which is estimated at SR 1.2bn (\$400m).

Shobokshi one of Saudi Arabia's biggest contracting

companies after Bin Ladin, has diversified interests in trading

and property development, and has had cash flow problems for several months as a result of

delays on payments on contract payments and insufficiently

liquid investments.
In May, Al Bahrain Arab
African Bank (ALBAAB)
arranged a \$46m rescheduling

package with a syndicate of 10 other banks for the outstanding

portion of a \$100m medium

term loan, but this facility was not utilised because the bor-

a diesel engine has been offered in a small jeep.
Renault owns 46 per cent of AMC and the U.S. group is basing its new cars on Renault designs, while using its own expertise to revamp the Jeep four-wheel-drive range. of the R5 was dropped from the range last year. Mr Tippett made it clear AMC would like to import the new compact, fibreglass-hodied

AMERICAN MOTORS, number Mr Tippett, who was speaking built for Renault by Matra in four in the U.S. motor league, after delivering the keynote France, but no decision had been made yet. He pointed out deal for Renault's image in the U.S. if it was introduced.

Next year, AMC's U.S. sales When over 35,000 cars and 10,000 Jeeps to be sold in Canada are added, plus more will be boosted by the introduc-tion of a pick-up version of the new Jeep. Mr Tippett said be than 40,000 Jeep exports, total worldwide vehicle sales in 1984 would be disappointed if 1985 sales did not reach 50,000—and that would be entirely incremental because AMC is not in the pick-up market at the Sales of built-up car imports

from Renault are expected to fall, however, from around 33,000 to below 25,000 partly because the American version AMC has also revised up-wards sales forecasts for a convertible version of the Alliance (based on the R9) to be introduced this autumn. Mr Tippett said about 16,000 would be sold next year against previous estimates of only half that number.

AMC broke a succession of remain "modestly profitable" 14 quarterly losses with a \$7.4m sales volumes would be low in view of the restricted production (Matra might make a maximum of 40,000 a year) but the Espace would do a great deal for Renault's image in the HS if it was intended.

> The programme will culminate with a new US\$580m plant at Brampton, Ontario, in Canada, coming on stream in mid-1987. The Canadian plant will produce a car based on the successor to the R25, the executive model Renault re-cently launched in Europe. (AMC still has no plans to import the R25.)

By 1988 AMC models will cover 50 per cent of the car market against 25 per cent to-day, and it hopes its market share will rise from around 14 per cent to between 4 and 5 per cent — giving U.S. sales of 500,000 cars.

The Mondadori group, which has been looking for a financial injection for its television

station, last year made a L6bn net profit on turnover of L1,000bn. be put into liquidation and reconstituted immediately as Rete Quattro Mark-Two.

The assets of Rete-Quattro—director of Rete Quattro will be

French retailer in U.S. deal

CASINO, a leading French retail and food group, says its U.S. subsidiary Casino USA will bid for control of Smart and Final Iris Corporation, which was formerly known as Thriftimart. Casino USA will acquire all outstanding SFI shares that it does not already own.

CIT-Alcatel raises stake in U.S. group

French telecommunications This was almost double the equipment manufacturer, is to comparable six month result. In reinforce its bridgehead on the 1983 the U.S. company had U.S. market by taking more profits of \$2m after suffering shares in the Reno-based Lynch heavy losses in the preceding telecommunications concern years.

from 25 per cent to 42 per cent. • In an equally significant

agreed to buy 550,000 shares in Lynch for \$11m.

The transaction, which must be cleared by the French Government, is the latest move in CIT-Alcatel's efforts to penetrate the U.S. telecommunications market in the wake of the Agreement of the Ag

CIT-ALCATEL, the leading helf profits of \$1.7m this year.

The French company, constrained move, CGE has formed trolled by the nationalised CGE a new factory automation substitution in the companies of electronics conglomerate, has evale de Productique (CGP). The new company regroups the Lynch for \$11m.

The transaction, which must factory automation and systems activities of a number of CGE subsidiaries including Alsthom-Atlantique, CGEE Alsthom, and CIT Alcatel, among the main

tions market in the wake of the deregulation of the American telephone market and the break-up of the American Telephone and Telegraph (AT&T) monopoly.

CIT-Alcatel acquired is initial 25 per cent stake in Lynch in 1981. The U.S. company has since assisted the

initial 25 per cent stake in Lynch in 1981. The U.S. company has since assisted the French gdoup to convert it equipment, inclinding its E-10 digital switch system, to U.S. standards. CTI-Alcatel now hopes to increase substantially to matter to foreign its U.S. presence with the target of reach in annual U.S. sales of FFr 1bn by 1987.

Lynch, a manufacturer of telecommunications transmission equipment, reported first-

EKKZIN

Merrill Lynch HQ to be centralised in New York

MERRILL LYNCH, the world's 3.9m sq ft of space. The first leading securities broker and a 34-storey building will be ready realor force in financial ser- for occupancy in mid-1986 and vices, plans to move its corthe second 44-storey building is porate headquarters to the scheduled for completion in World Financial Centre, now 1987. under construction near the In separate transactions, World Trade Centre in down-town Manhattan. Merrill is to sell its 1.8m sq ft headquarters in Liberty Plaza

town Manhattan.

In March 1982 Amex, one of Merrill Lynch's prime competitors in the financial services field, said it was moving to the same location.

Merrill Lynch will occupy two buildings, which will be owned by a joint venture with Olympia and York, the developer of the 8m sq ft complex. The move will consolidate Merrill's 11 headquarters and administrative facilities throughout Manhattan, and will put a cap on its long-term occupancy costs.

The two buildings will give headquarters in Liberty Plaza and its leases in the building for undisclosed sums to Olympia and York.

"We estimate that our occupancy costs will be at least 25 per cent less with our new strategy than if we continued our current approach," said Mr Edmond N. Moriarty, Merrill executive vice-president. The joint venture would provide the company with a share of the residual value of the buildings and the financial and operating benefits associated with ownership, he said.

AMC to increase Renault business

BY KENNETH GOODING IN DETROIT

particular.

bounced around in summerthin trading and closed just
marginally lower following the
release late on Friday of the
July Federal Open Market
Committee (FOMC) meeting
Teport

Teport

Several
The announcement of the prothe announcement of the proforeign buyers has already
caused an increase in the yield
curve in the three- to 10-year
maturity range in which these
new issues are likely to be

launched.
This shift has probably been amplified by the Treasury plan for a trial issue of a 20-year bond callable after five yearsa move which is perceived as reducing supply at the longer end of the maturity spectrum and increasing it among the intermediates. The current 20-year issue is currently yielding about 12.59 per cent.

Short-term interest rates remained firm. The Fed Fund rate, despite falls on Wednesday, Thursday and Friday, remained over 11.5 per cent throughout the week.

In the corporate markets the surge of new issues continued. Nearly \$1.1bn of issues were launched bringing the total so far in August to \$6.6bn. New issue rates were generally unchanged but seasoned medium-term issues increased in price by a point and long-term bonds posted increases of around

Among the mid-point of the target Aristar sold \$50m of 14f per range. cent 10-year notes at par, Aveo Financial sold \$100m of 10-year notes to yield 12.815 per cent. runds inter-meeting monitoring First Atlanta sold \$100m of range to 8-12 per cent had been expected—indeed, given the recent performance of the funds rate, some observers had expected a larger upward expected a larger upward revision.

Thus the report contained The fact that many of the new corporate issues last week were 10-year notes represents a significant further shift by

> ingly nearly all the issues were brought off the Rule 415 shelf. Paul Taylor rower did not meet certain conditions.

Italian publisher in TV disposal

grammes to Sig Berlusconi's Fininvest holding company for L105bn (\$59m). The "Rete Quattro" network features a mixture of flashy variety and American crime shows. It is to

BY ALAN FRIEDMAN IN MILAN

THE ITALIAN television empire of Sig Silvio Beriusconi, the Milanese entrepreneur whose brash commercial MORGAN STANLEY, the New York investment bank has been York investment bank has been called in as financial adviser to Ali and Fahd Shobokshi, the troubled Saudi construction group, and is working on a general rescheduling of the Jeddah-based company's financial abbased company's financial abbased. stations have been challenging state-run television, is to grow even larger as a result of an agreement yesterday under which the Berlusconi group will take 50 per cent of "Rete Quattro," the loss making netcial obligations.

Bankers in Bahrain say there will be several different arrangements with groups of

should be about 450,000.

work owned by the Mondadori publishing group.

Mondadori, Italy's biggest publishing group, said it had agreed to sell all of its pro-

Loan policy slows growth in profits at Public Bank

BY WONG SULONG IN KUALA LUMPUR A DELIBERATE policy of slowing down loanse has acted as a brake to the profit growth of public bank, Malaysia's third largest bank. Pre-tax for the first half of 1984 fel marginally to 36m ringgit (\$15.6m), although after-tax profit was still 7.7 per cent higher at 20.2m ringgit. A DELIBERATE policy of slow- ceeding 30 per cent annually.

norm of 75 per cent. In the past five years, Public Bank has propelled itself the bank had slowed down through aggressive lending lending to the property market into one of Malaysia's leading in line with advice of the banks with growths rates ex- Malaysian Central Bank.

The takeover is subject to French Government authorisation and financing arrange-ments. Company officials were not available for comment.

FT INTERNATIONAL BOND SERVICE

THE REPUBLIC OF ITALY

This advertisement complies with the requirements of the Council of The Stock Exchange.

U.S. \$500,000,000

Floating Rate Notes due 1999.

The issue price of the Notes is 100 per cent, of their principal amount.

BankAmerica Capital Markets Group

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Credit Suisse First Boston Limited

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Merrill Lynch Capital Markets

The Notes constituting the above issue have been admitted to the Official List by the Council of The Stock Exchange, subject only to the Issue of the Notes. Interestion the Notes will be payable semi-annually in arrears in each March and September commencing in

Particulars of the Notes are available in the statistical services of Extel Statistical Services Limited and may be obtained during usual business hours up to and including September 11th, 1984 from the Brokers to Cazenove & Co.,

12 Tokenhouse Yard, London, EC2R 7AN.

August 28th, 1984

This announcement appears as a matter of record only.



DAI-ICHI KANGYO BANK NEDERLAND N.V.

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Amsterdam-Rotterdam Bank N.V.

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Swiss Bank Corporation International

Dai-Ichi Kangyo Bank Nederland N.V.

Limited

Pierson, Heldring & Pierson N.V.

Algemene Bank Nederland N.V.

August, 1984

STRAUGHTS
| Second | Secon Change on lesued Bid Offer day week Yield

Average price changes .. On day 0 2on wook -- 0° a

DEUTSCHE MARK

STRAIGHTS

Allied Chemical 7° 24... 125

Amca Intl. 8° 81 150

Annas 8° 91 150

Baxter Travenol 7° 94 200

Baxter Travenol 7° 94 200

Credit National 8° 94... 200

Degussa Int. Fin. 7° 94 100

EEC 8 92 200

EB 8 91 200

EB 8 91 200

EB 8 91 200

Finland Rep. 7° 91 150

Finland Rep. 7° 91 150

Gould Int. Fin. 7° 94 150

Int. Strandard 51e. 7° 80 100

Ireland 8° 92 150

Megal Fin. 8° 94 150

Megal Fin. 8° 94 150

Mitsbahi. H. 3° 82 WW 300

OKB 7° 88 200

Reynolda 0/5 F. 7° 94 125

Soc. Cent. Nuclear 8 91 100

Average price changes... On day - 0°; on week + 0°;
SWISS FRANC

STRAIGHTS

Issued Bid Oter day week Yield

Swedan Kingdom 5½ 94 125 1101 101½ 0 +0½ 5.59
Tauemkraftwerke 5½ 94 100 199½ 98½ 0 +0½ 5.68
Tobu Railwey 4 92 WW 100 195½ 95½ -0% -1½ 4.73
Tobu Railwey 4 92 XW 100 195½ 95½ 0 0 6.23
Transcaneds Pipe 5½ 92 100 193½ 98% 0 +0½ 5.72
World Bank 6½ 94 200 1100½ 101 0 +0¼ 6.00

FLOATING RATE Spread Bid Offer C.dta C.cpn C.yld

Average price changes... On day 0 on wreck 0

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EUROBOND TURNOVER

U.S. 5 bends Last week..... 12,060 15,465.1 Previous week 10,168.7 21,152.3 Other bonds Last week..... 2,112.5 1,261.5 Previous week 3,512.4 1,220.8

* No information availableprevious day's price.

† Only one market maker supplied a price. STRAIGHT BONDS: The yield is the yield to redemption of the mid-price; the amount issued is in millions of currency units except for Yen bonds where it is in billions. Change on week= Change over price a week

FLOATING RATE NOTES: Denominated in dollars unless otherwise indicated. Coupon shown is minimum. Cdte=Date next coupon becomes effective.
Spread=Margin above six month
offered rate (t three-month;
§ above mean rate) for U.S.
dollars, C.cpn = The current
coupon, C.yld = The current
yield.

yield.

CONVERTIBLE BONDS: Denominated in dollars unless otherwise indicated. Chg.day=Change on day. Cnv.date=First date for conversion into shares. Cnv.price=Nominal amount of bond per share expressed in currency of share at conversion rate fixed at issue. Prem=Fercentage premium of the current effective price of acquiring shares via the bond over the most recent price of the shares.

The list shows the 209 latest most recent price of the shares.

The list shows the 200 latest international bonds for which an adequate secondary market exists. The prices over the past week were supplied by: Kredletbank NY; Credit Commercial de France; Credit Lyonnals; Commerzhank AG; Deutsche Bank AG; Westdeutsche Landesbank Gironzentrale; Banque Generale du Luxembourg SA; Banque Internationale Luxembourg; Kredietbank Luxembourg; Kredietbank Luxembourg;

Internationale Luxembourg;
Algemene Bank Luxembourg;
Algemene Bank Noderland NV;
Pierson, Heldring and Pierson;
Credit Suisse/Swise Credit Bank;
Union Bank of Switzerland;
Akroyd and Smithers; Bank of
Tokyo International; Blytif,
Eastman, Pain, Webber International; Chase Manhattan;
Citicorp International Bank;
Credit Commercial de France
(Securities) London; Daiwa
Europe NV; EBC; First Chicago;
Goldman Sachs International
Corporation; Hambros Bank; IBJ
International; Kidder Peabody
International; Kidder Peabody
International; Kidder Peabody
International; Nomura
International; Orion Royal Bank;
Robert Fleming and Co.; Samuel
Moutagu and Co.; Sandinavian
Bank; Societe Generale Strauss
Turnbull; Sumitomo Finance
International; S. G. Warburg and
Co.; Swiss Bank Corporation
International; Wood Gundy.
Closing prices on August 24

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Catalia

August 28 1994

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VIN CARREST

New development chief for ICFC

Mr Richard Connell, 29, is the new business development the S. W. Farmer Group subsidered of ICFC, a division of Investors in Industry, a source of private venture capital for smaller businesses. Mr Connell joined ICFC, part of 3i, in 1980, working first as an investment controller in Leicester, before transferring to ICFC's head office in London in 1983.

Mr R. P. Robinson joins the SWISS REINSURANCE COMPANY (UK) on September 1 as assistant general manager and will head the general manager and will head the general business underwriting division. Mr B. K. Doody, deputy general manager, has retired.

Mr R. P. Robinson in IR B. K. Doody, deputy general manager, has retired.

Mr Part Carter and Mr Charles Group subsidiaries of Data-the five subsidi

winderwriting division. Bit B. K. Doedy, deputy general manager, has retired.

*** The Boardy general manager, has retired.

** THE BALDWIN GROUP—the Winsfard - based organisation which is the parent for a number of manufacturing operations. The board of manufacturing operations with Toache Ross and positions with Toache Ross and positions with Toache Ross and Farspean manager. Mr Staart Smithsen, fellow of the Institute of British Foundrymen, has been appointed marketing and sales director of E. A. Studies.

** Studies.

** THE BALDWIN GROUP—the Winsfard - based organisation which is the parent for a number of manufacturing operations. The board is more pany—has appointed from the parent for a number of manufacturing operations. The board is more pany—has appointed in the board of the board is more programmes, tolevision, and provided the Philip Barber as financial director. Mr Barter, 34, has been elected to the board is months after joined organization of the board is more programmes, tolevision, and provided in the parent for a number of manufacturing operations. The division has appointed marketing fallow of the board is more product marketing and selected to the board is more product marketing in the company as group accountant. Previously, he had positions with Toache Ross and Frageetter to the board is more with the parent of British Foundrymen, has been appointed marketing and sales director of E. A. Her will be responsible for all the company's new European heading and sales director of E. A. Her succeeding Mr Roy Are who takes only in the board of the feeth Lewis, marketing sales. Mr Has Section A. The Scotsman, The

Border Television, as sales director rail division, from September 3. He succeeds Mr Roy Arey who takes over responsibility for roadside advertising sales. Mr Keith Lewis, marketing services manager of "The Scotsman," has been appointed regional manager Midlands

Mr Paul Smith has been appointed marketing director of MILLER BUCKLEY CONSTRUC-

Mr Kenneth J. Ravenscroft has been appointed internal audit manager of OCEAN TRANS-PORT AND TRADING. He succeds Mr Brian Sturtivant who is retiring. Mr Ravenscroft joined Ocean in 1969. Since 1973 he has been financial controller of Ocean Titan division responsible for the group's non-liner shipping.

has worked for Miller Buckley for six years and was involved for part of this time in the group's design build company as a project manager.

INTERNATIONAL APPOINTMENTS

Texas Instruments makes three marketing changes

TEXAS INSTRUMENTS DATA
SYSTEMS DIVISION has created three new marketing appointments with responsibilities for TTs range of minicomputer products.

Mr Stephen Thomas has been appointed marketing manager, with responsibilities for professional computers terminals and peripherals. His responsibilities of marketing for the profressional computer standing including dealer support and technical support. He was previously a senior marketing consultant with Marketing Dynamics.

Mr Adrian Botterill has been appointed a product marketing manager for TTs professional computer with responsibilities for TTs range and Standard Mr Adrian Botterill has been appointed a product marketing for the profressional computer family, terminals and peripherals. He was previously seen appointed a product marketing by namager for TTs professional computer with responsibilities for TTs professional computers with responsibilities for professional computers family including dealer support and technical support. He was previously a senior vice president and chief financial and administrative financial and edministrative financial and edministrative financial and chief financial and saministrative financial and chief financial and chief

pany planning manager for tions. Mr Buettner joined Rust in 1964 as a design engineer and been appointed a product manager of projects—pulp and paper division. Mr Habeishi perisherals. He was previously with Olivetti's south west sales director — international operations of the group holding at Tierctor of CROCKER in 1971 and has served as projects—industrial division. Mr Rind joined Rust in 1985 as sentor division. CAD/CAM william L George, who joined manager of projects—industrial division; and manager of projects—industrial division; and manager of projects—industrial division.

Sir Malcolm G. Wilcox will retire as a director of CROCKER in 1971 and has served as project manager of projects—industrial division. Mr Rind joined Rust in 1985 as sentor division. CROCKER in 1971 and has served as project manager of projects—industrial division. Wr Rind joined Rust in 1980, was named vice president of the M & C group in 1971 and has served as project engineer; lead project engineer; by managing director. Mr Martin, who joined Ti in Dallas in 1991 and has served as project engineer; lead project engineer. Structural engineer. Provincial division and leaded th

This advertisement complies with the requirements of the Council of The Stock Exchange.

U.S. \$150,000.000

Chemical New York Corporation

Floating Rate Subordinated Notes Due 1996

The following have gereed to subscribe or procure subscribers for the above Notes:

Credit Suisse First Boston Limited

Chemical Bank International Limited

Commerzbank Aktiengesellschaft

Goldman Sachs International Corp.

Kleinwort, Benson Limited

Lehman Brothers International, Inc.

Merrill Lynch International & Co.

Fuji International Finance Limited

Mitsubishi Trust & Banking Corporation (Europe) S.A.

Mitsui Finance International Limited

Morgan Stanley International Salomon Brothers International Limited

Orion Royal Bank Limited

Sanwa International Limited

Société Générale

Swiss Bank Corporation International Limited

The Taiyo Kobe Bank (Luxembourg) S.A.

Union Bank of Switzerland (Securities) Limited

Yamaichi International (Europe) Limited

The issue price of the Notes is 100 per cent. The Notes have been admitted to the Official List by the Council of The Stock Exchange, subject only to the issue of the temporary Global Note. Interest is payable quarterly in arrears on the 6th day of March, June, September and December, the first payment being made on 6th December, 1984. Full particulars of the Notes and the Issuer are available in the Extel Statistical Service and may be obtained during usual business hours up to and including 11th September, 1984 from the brokers to the issue:

Cazenove & Co., 12 Tokenhouse Yard,

28th August, 1984



THE KINGDOM OF DENMARK Floating Rate Notes Due 1992

U.S. \$100,000,000

In accordance with the provisions of the Notes and the Agent Bank Agreement between The Kingdom of Denmark and Citibank, N.A., dated February 12, 1982, notice is hereby given that the Rate of Interest has been fixed at 12%% pa and that the interest payable on the relevant Interest Payment Date, February 28, 1985, against Coupon No. 6 will be U.S. \$632.50.

August 28, 1984, London By: Citibank, N.A. (CSSI Dept.), Agent Bank CITIBANG

CORRECTION NOTICE



CREDIT COMMERCIAL DE FRANCE U.S.\$250,000,000 Floating Rate Notes due 1996

For the six months 22nd August, 1984 to 22nd February, 1985 the Notes will carry an interest rate of 12%% per annum with a coupon amount of US\$632.50. The relevant interest payment date will be 22nd February, 1985. Listed on the Luxembourg Stock Exchange Trust Company, London
Agent Bank By: Bankers Trust Con

This advertisement complies with the requirements of the Council of The Stock Exchange in London.

It does not constitute an offer of, or invitation to subscribe for or purchase, any securities.

OLC

Orient Leasing Co., Ltd. (Orient Lease Kabushiki Kaisha)

(Incorporated with limited liability under the Commercial Code of Japan)

U.S. \$30,000,000

13 per cent. Guaranteed Bonds 1989

ISSUE PRICE 1002 PER CENT.

Unconditionally and irrevocably guaranteed as to payment of principal and interest by The Taiyo Kobe Bank, Limited (Incorporated in Japan)

The following have agreed to subscribe or procure subscribers for the Bonds:

Daiwa Europe Limited

The Taiyo Kobe Bank (Luxembourg) S.A.

Banque Bruxelles Lambert S.A. **Chemical Bank International Limited**

Citicorp Capital Markets Group

Banque Paribas Kleinwort, Benson Limited Nomura International Limited

Toyo Trust International Limited

Morgan Guaranty Ltd Norddeutsche Landesbank Girozentrale

The Bonds of \$5,000 each constituting the above issue have been admitted to the Official List by the Council of The Stock Exchange, subject only to the issue of the Temporary Global Bond.

S.G. Warburg & Co. Ltd.

Interest will be payable annually in arrears on 4th September in each year, commencing 4th September 1985.

Particulars of the Bonds and the Guarantor are available in the statistical services of Extel Statistical Services Limited and may be obtained during usual business hours up to and including 12th September, 1984 from the above or from the brokers to the issue.

> Vickers da Costa (U.K.) Ltd. Regis House

> > 28th August 1984

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SEK

AKTIEBOLAGET SVENSK EXPORTKREDIT (SWEDISH EXPORT CREDIT CORPORATION)

U.S. \$250,000,000

Zero Coupon Bonds Due 1994

ISSUE PRICE 32,925 PER CENT.

The following have agreed to subscribe or procure subscribers for the Bonds:

Daiwa Europe Limited

Morgan Guaranty Life

Al-Mal Group

Société Générale

Banque Bruxelles Lambert S.A.

Algemene Bank Nederland N.V. Enskilda Securities

Merrill Lynch Capital Markets The National Commercial Bank (Saudi Arabia)

Morgan Stanley International PKbanken Syenska Handelsbanken Group

Swiss Bank Corporation International Limited

The Bonds of \$10,000 each constituting the above issue have been admitted to the official list by the Council of The Stock Exchange, subject to the issue of the Temporary Global Bond.

Particulars of the Bonds are available in the statistical services of Extel Statistical Services Limited and may be obtained during usual business hours up to and including 11 September, 1984 from the above or from the brokers to the issue.

Cazenove & Co.

12 Tokenhouse Yard London EC2R 7AN

28th August 1984

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| 12 | Martin | 12 | Martin | 13 | Martin | 13 | Martin | 14 | Martin | 14 | Martin | 15 | Martin | 19 8 7 24 25 7 11 15 6 11 13 14 34 4 5 25 6 11 10 19 16 73 11 16 17 20 10 14 75 11 30 13 15 1 Saeck Hartman Single Effore Effore Effore Elector El ରେ ଅନ୍ତର୍ଜ୍ୱ କଥିଲି । ଏହି । ଏହି କଥିଲି । ଏହ 7 23 1 48 21 48 72 25 5 5 19 20 00 19 17 13 13 25 25 13 19 21 22 5 48 23 21 19 1 18 1 18 1 25 1 25 1 19 1 18 1 MACOM MICACA MED MICHAET MICHA FIAC FIAC PARCET FACTOR 57. 也是我也是我们的,我们是我们的,我们是我们的,我们是我们的,我们是我们的,我们也是我们的,我们也是我们的,我们也是我们的,我们也会会会会会的,我们也会会 Circle Con Nation (Con Nation 有野牛11以150年44公司的16万元75万年47年36万代的16万元76年1454区,18万元7655区的18万元44公司的16万元7550区的16万元755区的18万元755区的 AFFIXACOCOCITE IN INTERNATION CONTRACTOR AND CONTR 15% 15% 18% 31% 43 43% 18% 31% 31% 31% 31% 31% 31% 31% 31% 31% CrockN CrowN Cremch Cremch Creal Creal Custor Curring HEIGHT HE STAND HEIGHT HE STAND HEIGHT HEIGH · 一个,我们就是一个一个,我们就是一个一个,我们就是一个一个,我们是一个一个一个,我们是一个一个,我们就是一个一个一个,我们们就是一个一个,我们也会会会会会 JWT JRaver Jemse Jepne Jepne Jehr Jehr JerC JerC JerC Jene Jehr JohnCh J 146 179 3218 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 1136 179 2018 17 30 2312 1212 1213 2113 2114 224 235 235 214 3.在1000年的到外的对外的对外的,如果如此的的特别的自己的特殊的,但是这种的,他们是一种的,也是是一种的,他们们是一种的,也可以是一种的,也可以是一种的,也可以 DIMIG DAMING DAM <u>เช้นก็ขัชส์ตัดตัดที่ก็ก็สังกัจก็ก็ที่ตัดก็ที่ตัดก็สังเด็กก็ตับสังกับสิ่นส์ตัดตัดตั้งที่ตั้งสิ่นสดีจกลับก็ตามเก็บกรั้งเต็ด</u> 9.543325557727782256618797826533287227822877375652X77219153515288 64年新公司收收,以西域以通过各位内内。 电影影片 医感觉性的现在分词 医影响力 化多元硫基苯甲基 。 好到我后间还只要看到了可以形成的过去式和过去分词形式的现在分词或是不是有一种的一种的一种, -11₂ + 1₃ -1₂ +1

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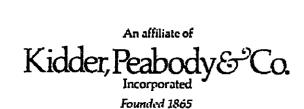
ได้ชี้ครับสัมกรับก็สมพัฒน์ใช้ก็พิดมัคเลือกให้เก็บสัมพัฒน์กรับสักว์กระจับมักได้และและใช้ที่สับทักให้ ได้ชี้ครับสัมพัฒน์ที่สับพัฒน์ใช้กับพัฒน์ที่สับพัฒน์ที่สับพัฒน์ที่สับพัฒน์ที่สับมักให้และเลือนใช้ที่สับทักให้ใ

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Market Makers in Euro-Securities



New York • London • Paris • Geneva • Zurich • Hong Kong • Tokyo

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AMERICAN STOCK EXCHANGE COMPOSITE CLOSING PRICES

Closing prices, August 27

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作名人的第三日代通过控制的 安日斯河南西西部岛与西斯西斯西部河北部,日日斯日的北部的农村和新州村

 激情说:"15年,我只要是我说2000年的15年的,在我们的17年的现在的现在分词,我们是我们的1880年,我们是我们的1880年,我们们是我们的1880年,我们

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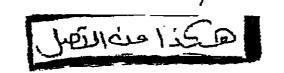
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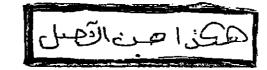
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WALL STREET

Reassessing induces setback

FINANCIAL MARKETS suffered a setback on Wall Street yesterday with a sharp early fall in stock prices being at-tributed to a degree of weakness in the credit markets which took some opera-tors by surprise, writes Michael Mor-

Trading was unusually slow, however, and this was attributed to a heavy holi-day schedule affecting parts of Wall

By the close, the Dow Jones industrial average was down 8.61 at 1227.92 on volume of 58m shares. During early afternoon trading, the measure had been down 13.36 points. In the broader mar-ket, the American Stock Exchange index dipped 1.09 to 211.93.

The credit markets turned lower behind a Federal funds rate which opened slightly higher at 11% per cent and later touched 11% per cent.

At the longer end, the price of the key long bond, the 12% per cent of 2014 shed more than a full point at times to dip be-low the 100 level. Late in the day it was priced at 99.12 for a loss of 20 basis points.

At the short end of the market, the yield on three-months Treasury bills jumped 19 basis points to 10.66 while six month bills added 16 basis points to 10.73. Money market rates also turned

The downturn in the credit markets followed a weekend during which Wall Street reassessed the minutes of the July meeting of the Federal Open Market Committee which, while they contained no particular surprises, did rule out the possibility of a further easing of credit policies.

The market also felt the effects of a good supply of both Treasury and corpo-rate issues, not matched by retail de-

The Treasury plans another active week. Following its regular auctions of three and six-month bills late yesterday, which produced yields of 10.60 per cent. and 10.70 per cent respectively, a further \$6.5bn of five-year notes are to be auctioned on Wednesday and \$8.25bn of new one-year notes will be auctioned on Thursday.

Despite the low volume in the stock market, institutions were active with large block trades of 150,000 shares in Tenneco, the diversified energy group, International Harvester, the truck and farm machinery manufacturer, and Chesebrough-Ponds, the health and beauty products group.
On the New York Stock Exchange,

AT &T was unchanged at \$19% as it announced plans to cut 11,000 jobs to reduce costs and stay competitive in the gh technology equipment manufactu ing business. General Electric fell \$% to \$57% after plans to reduce its workforce by 1,700

because sluggish sales were forecast for 1985 and inventory levels had now returned to normal. Among blue chips, IBM shed \$1 at \$124% and General Motors dipped \$% to \$75.

Teledyne, the electronics and avionics group, fell \$1% to \$263%. Texas Instruments shed \$1% to \$144% while the photographic and chemicals group Eastman Kodak dipped \$\% to \$76. NCR, the business systems and cash registers manufacturer eased \$\% to \$26\%.

Against the trend, farm machinery

makers edged higher following press comment on the outlook for the industry. International Harvester added \$1% to \$8% amid firmly dismissed market rumours of a possible bid.

On the American Stock Exchange, American Motor Inns, unchanged at \$21% was among the most actively traded issues in the wake of the bid battle by American Hotels and Prime Motor Inns.

TOKYO

Spectators crowd the sidelines

A DRAB session in Tokyo yesterday left prices slightly higher in very light trading as investors, generally passive to-wards the end of the month, failed to find any strong incentive, writes Shigeo Nishiwaki of Jiji Press.

The Nikkei-Dow Jones average gained 5.06 to 10,568.72 for a five-day rise of 57.69. Volume contracted sharply to 155.04m shares from Friday's 240.36m with gains outnumbering losses by 370 to 316.

Investor interest in stocks has faded despite an improved investment climate. Business performances have been advancing steadily and the yen rebounded from a low of 247 to the dollar.

With many institutional and individual investors digging in on the sidelines, the market was shored up by active trading in some incentive backed issues. Nippon Gakki returned to favour on renewed interest in the company's re-

Markets in London and Hong Kong were closed for public holidays.

search and development of a Thyristor semiconductor. It added Y40 to Y1,040 on volume of 7.1m shares, the largest for

Oki Electric rose Y14 to Y765 on reports that it has developed a transistor using gallium arsenide materials capable of light emission, reception and amplification.

Blue chips were mixed in thin trading. Toyota Motor firmed Y20 to Y1,480 and Matsushita Electric Industrial Y20 to Y1,670, but Hitachi eased Y10 to Y845 and Sony Y30 to Y3,410.

The bond market was depressed in both over-the-counter and inter-broker trading. Institutional investors and securities firms awaited a clearer trend in bond prices. The yield on the benchmark 7.5 per cent government bond due January 1993 rose in small-lot selling to 7.245 per cent from Saturday's 7.220 per

AUSTRALIA

THE ABSENCE of a clear direction from mixed in subdued trading. The All Ordinaries index closed 0.2 higher at 744.7. BHP added 10 cents to A\$10.75, Bell Resources 5 cents to A\$4.55 but CSR

slipped 1 cent to A\$3.37. SINGAPORE

LACKLUSTRE trading in Singapore left prices mostly lower. The Straits Times index ended 4.40 off at 926.37, with losses outpacing gains by more than three-to-one.

The single feature was National Iron, which shed 26 cents to S\$4.12, after a 68.8 per cent drop in first-half net prof**EUROPE**

Oils prove source of inspiration

A BELIEF among European investors that the influences governing last week's market movements had not yet run their course was evident yesterday although some bourses were deflated due to the closure of London markets. A number of oil shares on different ex-

changes featured strongly, however.

Parts opened the week with investors stimulated by a cut in the call money rate to 10% per cent from 11% while the start of the new account on Friday continued to prompt buy orders. The main feature of the session was Petroles BP which spurted ahead by 32.5 per cent with a FFr 27.30 gain to FFr 111 after Friday's suspension due to a buying imbalance. The group is a member of a consortium led by Elf which has discovered oil near Pau, south-west France. Elf finished unchanged at FFr 235, after a rise of over 10 per cent in the last

Elsewhere, constructions and electricals were favoured while Peuceot rose FFr 4.90 to FFr 213.90 amid renewed boardroom conflict.

High-technology names attracted most attention in Frankfurt with Nixdorf extending its recent rises with a further DM 4.50 to DM 520.50 and PKI DM 11.50 stronger at DM 535.

Deutsche Bank retreated DM 5.50 to DM 322 in a broadly weaker banking sector while profit-taking and further consideration of the chemical sector's recent profit declarations saw further losses. Schering was weakest with a DM 3.50 fall to DM 351.50.

The Commerzbank index dropped 3 points to 984.4 while an ambivalent bond market sought, but failed, to find direc-

Low volume and a lack of enthusiasm saw Amsterdam edge lower with the ANP-CBS index 0.4 off at 165.5. The 1985 draft budget was viewed neutrally while some still hold out hope for a cut in U.S. interest rates.

Banks starred in Brussels on hopes of a discount rate cut tomorrow while industrials witnessed market leader Petrofina drop BFr 120 to BFr 7,490 on profittaking as the group denied suggestions that it is seeking a listing on the New York Stock Exchange.

Losses developed on a broad front in Copenhagen with Novo Industri the main exception with a DKr 115 rise to

Both Zurich and Stockholm ended mixed in subdued trading while foods were the only bright spot in Madrid. Milan tended firmer in light trading.

SOUTH AFRICA

GOLDS closed little changed in a weaker Johannesburg. Trading was dull with the lack of direction on the bullion market emphasised by the London holiday. Randfontein lost 50 cents to R69, Marievale 30 cents to R3.55 and Vlakfontein 15 cents to R3.05, while Western Deep

Levels added R1 at R74.50.

CANADA A WEAKER tone emerged in Toronto with only base metal mining issues showing any degree of firmness. Golds were especially weak and energy issues also off.

Montreal mirrored the lower trend, although the weakness was less marked.

d indices

118.33 117.18 18.91 116.30 127.83 (18/1) 108.36 (24/7)

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Transport	519,86	520,62	822.87	534.27	528.95	512.46	\$12.63 (IVI)		812.53 (9/1/84)		Composite	166.44.	187.51	162,12	167.51	197.06	167.83	199.33 (5/1)	147.32 (24/1)	172.15 (10/18/83)	
Villates.	125.26	128.72	128,82	139,09	130.39	128,30	134.33 E/I)	122,25 (15/8)	163.72	10.5			<u> </u>	т.	Aug 15	7	tug B	Aug	,]	Yest Ago (A	Approx)
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MOSTINEAL Particle

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AUSTRIA Credit Aiktlen (2/1/62)	55,24	55.21	55.29	53.25	. 58.21 (2/1)	55.29 (15.A)
BELGIUM Belgian SE (\$1/12/68)	167,27	157,85	165,60	154,76	157.8 (24/8)	185,28 (4/1)
DENMARK Copenhagen SE (5/1/85)	188.68	188,84	192,65	192.10	225,21 (26/1)	179,27 (1/6)
FRANCE CAC General (51/12/82) Ind Tendance (50/12/83)	171.0 110.0	168.8 198,5	168.7 167.7	185.7 107.6	181.7 (8/5) 115.0 (8/5)	155.6 (3/1) 99.4 (5/1)
GERMANY FAZ Aktien (81/12)68) Commerzbank (1/12/58)	358,68 884,4	338,62 587,4	537.97 8.989	341.59 993,8		817,17 (25/7) 917,7 (25,7)
HONG KONG Hang Seng Bank(61/7:64)		895,68	891.12	907.59	1170,35 (19/3)	746,02 (15:7)
ITALY Banca Comm Ital. (1972)	219,52	219,52	220.40	219,78	225,57 (1/2)	152,00 (2/1)
	10668,72 815,84		10545,5 815.03		11,190,17 (4·5) 876,62 (2/4)	

WORLD Capital Intl. (1 1/70)		185.1	184.80	184.7	190,6 :5 5:	184,6 (24/7)
SWITZERLAND SwissBank Opn.(51/19/58)	580,5	560.5	881.5	582.4	888,5 S 1:	\$54,5 (25/7)
SWEDEN Jacobson & P. (1/1/58)	1508,42	1,505,16	1525,58	1534,68	1594.5 (5/2)	1,388,00 (29/5
SPAIN Madrid SE (50/12/65)	187.72	158,07	159,40	129,69	141,05 (6 9)	101,02 (3/1)
SOUTH AFRICA Gold (1968) Industrial (1958)	(n) (n)	987.7 990.7	1004,5 900,9	! 895,5 898,5	1075.6 (5/6) 1105.5 (26:6)	
SINGAPORE Straits Times (1985)	926,78	951.18	832,28	1 940,80	1071,91 (2)	667,26 : 12/2
NORWAY Oslo SE (4/1/65)	266,25	285,99	265.47	264,44	298,79 (9:5)	221,67 ,4/1)
ANP-DBS General (1970) ANP-CBS Indust (1970)	165.8 152,8	132,5	152,1	151,5		118,7,18,8

** Saturday August 25. Japan Nikkel-Dow 10,583 66 TSE 814.74. Base values of all indices are 100 except Australia All Ordinary and Mo NYSE All Common—50: Standard and Poors—10: and Toronto Com Metals—1,000. Toronto indices based 1975 and Moniteal Portloko 4 sludring bonds. ‡ 400 industriels. § 400 industrials plus 40 Utilitie sciais and 20 Transports. c Closed. u Unavariate.

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Stefan Wagstyl looks at James Neill's recovery

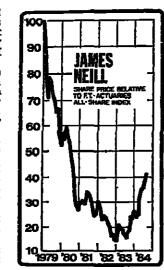
Having to move fast to repel boarders

James Neill, the Sheffield-based maker of hand tools which is staging a rapid recovery, might be forgiven for feeling wary about the intentions of one of its biggest shareholders.
For last week, the day before Neill surprised the City with a 120 per cent increase in interim profits, the acquisitive Suter group, headed by Mr David Abell doubled its stake to over 10 per

than others was the impact of a recovery programme launched only last November when Mr Peter Bullock, former managing director of lawnmower maker Flymo, took over as Neill's chief

executive.
Suter is saying nothing about its plans for the 10.74 per cent Neill stake. But Suter, which has activities in refrigeration and air-conditioning, has a policy of building up and making use of strategic shareholdings in other commands.

mpanies. With a market capitalisation of £14m, Neill is not an impos-sible takeover target for Suter which is itself capitalised at which is a likely captured at 27m. Earlier this year Suter tried unsuccessfully to capture the engineering group Francis Industries with a £14m bid, after first acquiring a 26 per cent



rationalise a company which saw pre-tax profits fall from a peak of £3.74m in 1977 to heavy losses in 1981 and 1982, before recover-ing to a £0.7m profit last year on sales of £48m.

This wear Naill has made

on sales of £48m.

This year, Neill has made almost £1.4m in six months to the end of June on sales of £27m including saw blades, magnets, engineers and mechanics tools, files and precision measuring environment.

However, Neill, which is 30 fees and precision measuring fearly, hopes that its rapid recovery is putting it out of Suter's range. The share price which has fallen as low as 20p in 1983-1984, hit 80p following last week's figures.

The price movement reflects the action the new chief executive has taken to reorganise and

John Beales turns in £609,000

Pre-tax profit at John Beales
Associated Companies was
£609,000 in the 63 weeks to May
31 1984 compared with £461,000
in the 52 weeksk to March 19
1983.

Turnover of this manufacturer
of "Marathon" underwear and
outerwear, was £16.07m against 15.8p (12.01p) basic, with 14.57p
outerwear, was £16.07m against 20.00p
£20p share were
to £12.49m. Operating profit
advanced from £397,000 to
£20p share were
to £21,000, and investment income
totalled £148,000 against £132,000.

The final dividend is raised
from 2p to 2.5p for a total of
£2.8p (52 weeks).

There was an extraordinary
debit of £30.000 (£150,000).
Earnings per 20p share were
further progress in 1985.

They add that obtaining orders
during the last period reflect
the satisfactory progress being
made in all areas of the business,
can look forward to a year of
further progress in 1985.

They add that obtaining orders
during the last period reflect
the satisfactory progress being
made in all areas of the business,
can look forward to a year of
further progress in 1985.

They add that obtaining orders
during the last year has been
further progress, and they believe shareholders
further progress in 1985.

They add that obtaining orders
during the last year has been
further progress in 1985.

They add that obtaining orders
during the last year has been
further progress being
and they believe shareholders
further progress in 1985.

They are stablished a successful management team, a strong
balance-sheet and positive direc-

n the Treasurer, Investors in Indiasary SEI 8XP. (01-928 7822 Ent. 2367.) IN INDUSTRY Of Investors in Industry Group pic.

Group half-year report

SKF Group profit for the first six months of 1984 was 524

Sales were 12% higher than for the same 1983 period.

million Swedish kronor (Skr 270m) before exchange differences.

The half-year was marked by continued growth in volume sales and lower net financial costs. The total cost of goods sold was

Rolling bearing income improved 134 million to 380 million

kronor, with sales 7% up on the previous first half-year SKF Steel,

with a 58 million kronor profit, recovered from its 31 million

Earnings per Parent Company share went up to 9.95 kronor

kronor deficit of 1983. Sector sales rose 25%. Cutting tool turnover rose 16%, profits advancing to 53 million (Skr 23m). Income from other products was constant at 33 million kronor in

Today's Rate 1134%

3i Term Deposits

Terms (years) 3 4 5 6 7 8 9 10 Interest % 11% 11% 11% 11% 11% 11% 11% 11% From 6th April 1985, interest will be paid after deduction of tax at the

Sales (MSkr)

Operating income before depreciation (MSkr)

Income before exchange

Capital expenditure (MSkr)

reduced in proportion to sales.

spite of higher total sales.

differences (MSkr)

Average number of

employees at work

Deposits of £1,000-£50,000 accepted for fixed terms of 3-10 years. Interest paid half-yearly. Rates for deposits received not later than 7.9.84 are fixed for the

ted to come to a further £1m in the second half. The biggest contribution to recovery has been cutting labour. Neili had previously reduced the workforce from 4,100 in 1979 to 2,500. But, says Mr Bullock, these cuts hit production workers and spared too many others, especispared too many others, especially senior staff. Since last December, the axe has been directed at management and non-production workers, cutting 300 jobs so far with 90 more to go by the end of the year.

Further savings have come Further savings have come from concentrating production in Sheffield on one of the company's two sites in the city with the eventual aim of clearing the second site altogether for redevelopment. If the plan succeeds sale of the site would greatly reduce borrowings. Production at a third major plant in Warrington is to continue.

Product lines have been cut to secure economies of scale and

eliminate low-margin items.
Retrevehment is not the whole story. With a new emphasis on marketing, Neill intends to make better use of its brand names and to sell tools braid names and to sell tools more aggressively to DIY stores to reduce its dependence on industrial users. A separate unit has been set up to make and sell a newly-launched instrument for which Neill has high hopes—a hand-held computer-controlled

ELDORADO NUCLEAR LIMITED

U\$\$180,080,000 Floating Rate Notes due 1989 In accordance with the provisions of the

Notes, notice is hereby given that for the period from 28 August 1984 to 28 February 1985 the Notes will carry an interest rate of

123/16% per arrium. The interest nevable on the relevant interest payment date. 28 February 1985 will be US\$371.48 per \$5,000 Bearer Nete/95,000 principal amount in Registered form.

THE CHASE MANHATTAN BASIK R.A.

28 Aegost, 1984

Jan/June 1984 Jan/June 1983

8,051

705

*2*70

280

42,293

9,022

951

524

242

43,215

LONDON, AGENT BANK.

Re-rating setback for **CU** after **U.S.** losses

Exeter Building

disappoints at interim stage

appointing."

Depressed contract performance in the early mooths continued despite improved weather.

New work obtained earlier in the

year is now beginning to con-tribute, but it remained difficult to obtain worthwhile margius in fierce tendering competition, he

says.

First half turnover rose from

15.79m to £21.24m. The loterim dividend is effectively held at 2p — taking into account the one-for-four scrip last year.

Order books of this USM com-

order house of this Using company are improving in some of the group's companies, but pricing remains keen and it still seeks some additional profitable work to maintain the level of

Mr Stoneman says sales of new

tire will affect the potential for 1985.

After tax of £32,000 (£70,000) and dividends of £76,000 (same), retained profits fell from £181,000 to £11,000. Earnings per 50p share were shown as down from 6.8p to 2.3p.

Clearance has been given by the Department of Trade and Industry for the transfer to Business Press International, a

subsidiary of Reed International, of the newspapers making up

the News Shopper series published by Mega Newspapers.

F.T. Share Information

Reed Intl.

appointing."

Commercial Union's loss making Commercial Union's loss making U.S. insurance operations have suffered another setback with the decision of A. M. Best, the leading U.S. insurance rating agency, to lower the rating on CU's U.S. property and casualty operations from A to B.

The new rating, which is still categorised as "very good" by the new Jersey-based rating agency, follows heavy losses by CU in the U.S. and its recent announcement of a major cutback in its operations there.

A. M. Best is an independent agency which publishes an

THE LIQUIDATORS of Hong-kong (Selanger) state the funds available at the date of the company's liquidation, after providing for outstanding tax and liabilities, a first distribution in the liquiration of £5 per share was made on July 7 amounting to £4.5m.

During the year the companies in Killinghall Tin (Malaysia) Berhad and H and C Laytex Berhad, were scid realising £1.14m and £146.252 respectively, both being subject to UK corporation tax on the chargeable gains arising yet to be agreed with the Inland Revenue.

Investments in Castlefield (Klang) Rubber Estate and Edensor Rubber Estate were realised early in the current year as a result of offers to share to mot received approval to date to its renewal in their favour.

SHARE STAKES

SHARE STAKES

Hongkong Rubber's

A. M. Best is an independent agency which publishes an annual rating of U.S. insurance companies, amongst other things. The annual report, which grades insurance companies from A+ and A, both regarded as excellent, to B, BC, and C, is widely followed by the insurance industry and is often used as a guide to directing new business. new business.
Commercial Union's U.S. operations lost \$110m (£84.2m) in auons lost 3110m (£84.2m) in the U.S. last year, as against \$85.6m in 1982. In the first six months of 1984 the company posted a net operating loss of \$34.8m.

Ordinary and 1,098 Preference shares.

Ballie Gifford Technology—
The Bank of Scotland 1975 Pension Scheme has acquired 50,000 ordinary shares and now holds \$80,000 (7.27 per cent).

Daejan Holdings—Mr B. S. E. Freshwater has sold, as administrator of the estate of his late father, 15,000 ordinary shares in which he had non-beneficial interest.

Munton Bros.—Mr S. Gould, a director, has sold 228,000 ordinary shares at 41p and now holds 227,358 ordinary.

Warner Estate Holdings—Mr J. G. Day, a director, has disposed of his interest in 12,535 ordinary shares to the beneficiary of a trust for no consideration.

Marks and Spencer—Lord Sieff of Brimpton, a director, has disposed of Brimpton, a director, has disposed of his interest in 12,535 ordinary and recent purchase, now holds 5,648,018 shares (7.29 per cent).

Allied Celloids Group — The London and Manchester group has bought a trust — the London and Manchester group has bought a further 10,000 shares and now holds 1,210,000 ordinary shares and now holds 1,210,000 ordinary shares (7.29 per cent).

Bankers' Investment Trust — the London and Manchester group has bought a trust — the London and Manchester group has bought a further 10,000 shares and now holds 772,500 shares Trust

PRE-TAX profits at Exeter Building and Construction Group fell from £327,000 to £119,000 in the six months to June 30 1884. Mr D. Stoneman, the chairman, describes the result as "dis-appointing"

beneficiary of a trust for no consideration.

Marks and Spencer—Lord Sieff of Brimpton, a director, has disposed of 25,000 ordinary shares.

J. H. Fenner — Scrimgeour, Kemp-Gee and Co purchased 140,000 ordinary shares at 141p on behalf of Hill Samuel.

Stockholders Far East Investments — The Halifax Building Society has purchased 100,000 ordinary shares and now holds 450,000 shares (5.625 per cent).

A. Jones and Son—As a result of recent transfers the following companies now hold the following 4.55 per cent net cumulative

companies now hold the following 4.55 per cent net cumulative preference shares: Control Nominees 6,000 (8.75 per cent); Medlock and Medlock 14,060 (20.09 per cent) and NFU Mutual Insurance Pension Fund Trust Co 13,700 (19.57 per cent).

Archimedes Investment Trust has sold 25,000 income shares reducing its holding to 75,000 (6.12

a director, has acquired 50,000 shares and now holds 201,000 shares. Healso has a beneficial interest in 2,000 shares registered in the name of his

shares. Healso has a beneficial per cent of the participating interest in 2,000 shares registered in the name of his daughter.

Helical Bar — R. A. Thomas, a director, has purchased 10,000 shares at 25p. S. J. Murphy, a director, has purchased 10,000 shares at 27p.

Higheroft Investment Trust—
J. H. Robertson, a director, has disposed of, by gifts to his grand-children, 6,000 ordinary shares.

Wight Collins Rutherford & Scott — the following directors havesold share:— A. D. Rutherford has sold 40,000 and now holds 405,100; R. Collins 40,000 and now holds 445,100; P. J. ordinary shares representing Scott 40,000 and now holds 5.1 per cent.

winding up details

Property Security Investment 441,100 R. Wight 17,500 and now Trust—Sir Hugh Cabitt, a director, has ceased to be interested has sold 5,000 and now holds in 8,041 Ordinary shares. His 50,390 shares.
total interests are now in 35,878
Ordinary and 1,098 Preference shares.

Ballie Gifford Technology—
The Bank of Scotland 1975 Pension Scheme has acquired 50,000

W. A. Tyzack — Acto Western

cent). New Throgmorton Trust (1983)—London and Manchester Group has increased its holding to 2,210,000 shares (5.64 per

Smaller Companies Interational Trust—Churches and Iniversities Widows and Universities Orphans Fund has sold 120,000

shares. The Ex-Lands—Following a The Ex-Lands—Following a purchase of 755,000 shares the Kwahu Company is now interested in 1,962,380 shares (43.99 per cent). The shares were acquired from Western Selection whose interest in the shares of Ex-Lands has been reduced to

Medick and medick 14,000 inil.

Medick and medick 14,000 inil.

(20.09 per cent) and NFU Mutual
Insurance Pension Fund Trust
Co 13,700 (19.57 per cent).

A number of larger developments are in progress, but these will not contribute materially to profit in 1984.

Cash balances and investments have been sustained and resources are available for its planned activity. Mr Stoneman says he cannot forecast with certainty as to how the economic sentiment and recent Government steps to restrict expenditure will affect the potential for 1985.

Medick and medick 14,000 inil.

(20.09 per cent) and NFU Mutual
Insurance Pension Fund Trust on il.

British American and General Trust—R. A. B. Nicolie, a director, has purchased 12,500 ordinary starts at 87p.

VG Instruments—R. D. Craig, a director, has purchased a further to share supon the attainment of majority of his daughter.

Davy Corporation — E. P. McTighe, a director, has purchased 10,000 shares at 67p.

Caristie-Tyler—R. M. William, a director between the potential for these to continue throughout three are expected to continue throughout the extended Insurance Pension Fund. Trust

Trust—R. A. B. Nicolie, a director, has purchased 10,000 ordinary stares.

VG Instruments—R. D. Craig, a director, has purchased a further 100,000 ordinary shares making its total holding 4,734,725.

The continue of the year.

Trust—R. A. B. Nicolie, a director, has purchased 10,000 ordinary shares ordinary stares.

Caparo Properties — Caparo Group has purchased a further 100,000 ordinary shares making its total holding 4,734,725.

The continue of the year.

Trust—R. A. B. Nicolie, a director, has purchased 10,000 ordinary shares ordinary shares ordinary shares ordinary shares ordinary stores ordinary stock of the company of the attainment of majority of his director, has purchased 10,000 ordinary stock of the company of the attainment of majority of his director, has a current or Trust—A. A. B. Nicolie, and irrector, has purchased 10,000 ordinary shares or 10,000 ordinary shares or 100,000

Hambro Currency Distribution Fund-Stake — The following shareholders hold more than 5 per cent of the participating

COMPANY NEWS IN BRIEF

The following securities have been added to the FT Share Information Service: Berkeley Group (Section: Pro-Berkeley Group (Section: Pro-perty)
Bush Radio (Electricals)
Capital and Counties 8{pcCnv Unsia 1999-2004 (Property)
DDT Group (Electricals)
Gee/Rosen Organisation
(Drapery and Stores)
New Zealand 11{pc 2014 (Int Banks and Overseas Govern-ment Sterling Issues) In the half year ended June 30 1984 Parambe has improved its net profit from £31,340 to £36,296, giving earnings of 0.8 p (0.69p) per share. The asset value was shown at 42.9p, compared with 38.2p at December 31 and 35.1p at end June 1983.

The interim dividend is 0.4p (0.25p). 1984 Parambe has improved its net profit from £31,340 to £36,296, giving earnings of 0.8 p (0.68p) per share. The asset value was shown at 42.9p, compared with 38.2p at December 31 and 35.1p at end June 1983.

Gross investment income came to £40,376 (£35,667), income from securities dealing to £22,003 (£32,134) and from works of art dealing £21,583 (£12,156). Tax charge was £15,799 (£18,516).

This advertisement is issued in compliance with the requirements of the Council of The Stock Exchange. It does not constitute an invitation to any person to subscribe for or purchase any Warrants.

Foreign&Colonial

F. & C. PACIFIC **INVESTMENT TRUST PLC**

Issue to Shareholders of Warrants to subscribe for 5,304,311 Ordinary Shares of 25p each

The Council of The Stock Exchange has admitted the above mentioned Warrants to the Official List.

Particulars of the Warrants are available in the Extel Statistical Services and copies of such particulars may be obtained during normal business hours on any weekday (excluding Saturdays) up to and including 11th September 1984 from.

> Grenfell & Colegrave 55/61 Moorgate London EC2R 6DR

> > 28th August 1984

EQUITIES

1		_	_		_							-
	intue price	Amount paid up	Latest Renune. date	19 High	,	Stock	Olosing	+0	Net DW.	Covered	Z Post	e
atrices of the sa	495 110 375 4624 4120 47 4185	F.P. F.P. F.P. F.P. F.P. F.P. F.P. F.P.	31/8 31/8 7/9 15/8 23/8 	110 88 89 86 126 105 100 220 140 £14	105 82 81 65 185 2564 92 48 85 185 213 170 28 242	Aiphameric Sp. Amuri. Bilise Arrow. Bilise Arrow.	125 236 48 96 210 135 213 171 28 282 128 393		57.75 57.75 57.76 91.90 91.90	055 82 88 755	78178 557 1.155 42.8	

FIXED INTEREST STOCKS

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lseue price	mount aid up	rtest nuno. date	19	84				Stoci	k.		12	E 60	ļ.,
<u> </u>	₹2]# T	High	Low					-			-5-Ē	L
\$100 eq 99,161 198,166		5/9 10/9	98p 30 ts 28 ts 100 ts 100 181g 96	92p 92p 294 22 997s 100 100s	Camic Derw Inti. E Marie Natio Ports TR Er	ent \ k. fo y 11 nwic moul term	e Wat /alley or Rec ?g% D te 191 10 th Wa 18% Co	102 C con. & eb: 20 42 6 78% 2 tey 13 bny. Un	Red Dev. 109, 18/86, 17/8/8 Red 18/8 Un	Deb Red. I 114% L 5, L Deb 197-	2007 n. 2095 1994	907 2978 2078 10078 100 1254 96	

"RIGHTS" OFFERS

Issue			196	34	Stock	Olosing	Ļ
price	돌	date	High	Low		충호	L
1135 A85,7 11 85 255 110 4 200 90 A84 370 199 375	NE NE P.P. F.P. NE NE P.P. NE	20/9 21/8 21/8 14/9 26/9 7/11 28/9 7/9 10/8 12/10 7/9	5½pm 80pm 12½ 100 310 35pm 4½ 290pm 25pm 295pm 445 73pm	40pm 11 88 857 30pm 4pm 257pm 15pm 192pm 192pm 60pm	#Applied Botanics Units	11 90 309 309m 49m 273pm 20pm 295pm 435	+ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

PENDING DIVIDENDS

Dates when some of the more important company dividend Dates when some of the more important company divisions statements may be expected in the next few weeks are given in the following table. The dates shown are those of last year's announcements except where the forthcoming board meetings (indicated thus*) have been officially notified. Dividends to be declared will not necessarily be at the amounts in the column headed.

HOUSE W

Min Beach P.

State of the state

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HORE CAPAC

ry COMPATTY

nnouncement las	t year."	•	
Date-	Announce	Description of the Control of the Co	Antoones- ment last year
rowSept 25	Final pii "	InvergordonSept 12	Interior 1.5
olo Alberican :		Ramann Sant A	Interim 4.5
Gold InvSept 1	Interim 500c	*LadbrokeAug 30 Laing (J.)Sapt 28 LairdSapt 10 LaporteSept 21	Interim 4.7
PortsSept 15	Interim 3	Laing (J.)Supt 28	Interim 1.25
sociated DairiesAug 28	Final 1,75	19170	Interim 2.2 Interim 4.0
rorsSept 28	interior nii	LasmoAug 30	interim 4.0
tomotive	(1160))161 22	Legal and	Section of the
ProductsSept 8	Interim 0.5	GeneralSept 14	interim 6
T Indukte Sept 21	Interim 3.375	London Merchant	
RSept 6	Interim 7.0	London Merchant SecsSept 13 Menzies (J.)Sept 22 Afilia and Allan Sept 28	Final 1.05
RSept 13	Interim 6	Menzies (J.)Sept 22	Interim 2.0
boock IntlAug 29 nk of	Interim 3.4	AllenSept 28	Final 9.0
ScotlandSept 20	Interior 11.5	Morgan	Luiai 3.V
matt DavsSept 20	Final 5.31	CrucibleSept 1	Interim 3.5
(Arthur)Oct 4	Final 2.95	NEISept 29	Interim 1,85
(Arthur)Oct 4	Interim 3.5	NEISept 29 P & O DefdSept 5	interim 4
OKEL	•	* ************************************	Interim 6
McConnellSept 15	Interim 1.55	Provident	
oweterSept 13	Interior 3.5	FinancialSept 8	
mt ChemsSept 27	Interim Q.6	PrudentialSept 13	Interim 5,5
Aarcepace,,.Sept 13	Interim 3.5	RMCSept 21 Ransomes Sims &	Interim 4.1
yton	***************************************	JeffriesSept 17	Interim 5.0
- EstateSept 18	Interior 1.9	JeffriesSept 17 RaybeckAug 25	Final 0.26
wn Boveri		HOCKITT ONG	
Kent,,Sept 7	Interim 1	ColmanSept 6	Interim 4.55
rmeh OilSept 14	interim 3.5	ReutersSept 13	luterim due
nning (W.) Sept 12 arterhallSept 22	Interim 0.5 Final 0.3	Rio Tinto- ZincSept 21	Interim 6.0
erterhouse		Rowntree	MICOTING Q.G
Group,Sept 1	interim 2.025	MackintoshSept 22	interim 3.2
mb English		Rugby Portland	
Stores:Sept 27	Interim 1.49	CementOct 3	Interim 2.7
nsolidated Gold	Final 16	SchrodersSept 8	Interim 0.44 Interim 0.7 Interim 2.75
Fields.,.Sept 13 ns PlantsAug 29	Final 5 sen	SeersOct 4 SedgwickSept 8	interior 0.7
oksonSept 6	Interim 3,7	Sime DarbySept 1	Final 6.8
oksonSept 6 stainSept 13 oda IntSept 7	Interim 5.5	*Slough	THU W
da IntSept 7	Interim 3	EstatesAug 29	Interior 1.52
	Interim 1.4 Interim 3.0	SuperdrugSept 29	nterim-1.4
GSept 26	interim 3.0	SteetleySept 22	laterim 4_0
getySept 20 benhamasOct 7	Final 11,0 Interim 2.2	Stewart WrightsonSept 7	
tsSept 8	interim 1.82	Sun AllianceSapt 5	Interim 3,85 Interim 2,2
nlop5ept 22	interim all	TermacSept 19	interim 3.6
: Sopt 3	Interim 1.65	Taylor	
tern		_ WoodrowAug 28	Interim 5.5
Produce,,,Sept 28	Interim 1.5	Tozar Kamaley &	
onsSept 19 et HidgsAug 30	Interior 6.0 Final 1.5	MilibournAug 1 Travis and	interim nii
emansOct 3	Interim 1.9	Arnold,Sept 28	Interim 1,68
ettanSept 29	Interim nil	Turner and	-
ESept 5	Interim 7.75	NewellSept 13	Interim Q.25
mbro LifeOct 5	Interim 4.7	*Utd BiscuitsSept 12	Interim 2,7
wleyAug 24	79.0 minestri	"United	
Ceramic See R	interim 2.5	NewspapersSept 25 VickersSept 22	interim 5
ga & HIIIOct 5	Interim 4.0	WairAug 29	interim 3.0
CeramicSept 6 gs & HillOct 5 ne CharmSept 13	Interim 0.75	wolls raper sept 13	Interim 6
ngkong and		Wimpey	
ranghai BkAug 28	interim due	(Geo.)Sept 29	Interim 0,85
FrageSept 29	lozarim 2.5	WoolworthSept 14	interm 2

Granville & Co. Limited

27/28 Lovat Lane London EC3R 8EB Telephone 01-621 1212 Over-the-Counter Market

						P/1	Ē
Capitalisau			·Change	Gross	Yleid		Ful
5000,₽	Сотрату	Price	on week	div.(o)	%	Actual	tex
6,029	Ass. Brit. Ind. Ord	137	+ 1	8.3	4.6	8.0	10
	Ass. Brit. Ind. CULS	142	_	10.0	7.0	-	
3,184	Airsprung Group	55	-	8.4	11.5	6.0	7
925	Armitage & Rhodes	37		2.9	7.8	4.6	7
38,649	Bardon Hill	124	- 2	3.4	2.7	12.5	20
2,385	Bray Technologies	43	– 2	3.5	8.i	5.0	Ž,
2,107	CCL Ordinary	177		120	6.3		
	CCL 11pc Conv. Pref.	113	_		13.2		
3,205	Carborundum Abrasives	535	. + 5	5.7	1.1	_	
1,585	Cindico Group	99	· · <u>-</u>			-=	_
5,156	Deboret Services	68	_	6.0	9.0	35.3	57.
15,149	Frank Horsell	235	+ 2	-		8.4	12
	Frank Horsell Pr.Ord.87	206	+ 1	9.6	4.7	. 87	- 15
3,512	Frederick Parker	25	- i	- 4,3	17.2	64	10
646	George Blak	35		- 740		8.3	
1,886	Ind. Precision Castings	46	- 1	7.3	15.9	12.7	
15,303	isis Ind. Services	200	— Š	15.0	7.5		. 10
6,688	Jackson Group	110		4.9	4.5	5.1	
31,882	James Burrough	231	+ 4	13.7	5.9	3.1	. 3
2,967	Jemes Burrough 9cc Pf.	88	÷ ī	12.9	16.0	8.2	8
3,080	Linguaphone Ord	145	`-	123	10.0-	==	
	Linguaphone 10.5pc Pf.	96	_	16.0	15.6		
11,853	Winihouse Holding NV	439	+4	3.8		31.6	.64
541	Robert Jenkins	63	- 2	20,0	37.7	62	
2,290	Scruttone " A "	48	- 7	5.7			
2,099	Torday & Carlisia	28		3.7	11.9	25.3	18
1,983	Travian Holdmos	433				92. Ied —	. 154
3,297	Umlook Holdings	21		1.3			
11,219	Waller Alexander	90	+1	. 0.0	0.2	10.2	
5,484	W. S. Yeates	235	- 2	0.0	4.	6.7 5.6	, ly
			- 4	17.4	7.5	5.0	- 11

FINANCIAL TIMES STOCK INDICES

from 4.95 kronor for the corresponding 1983 period.

Aktiebolaget SKE, S-415 50 Göteborg, Sweden

	Aug.	Aug. 25	Aug.	Aug. 21	Aug. 20	Aug. 17	High 1	984 Low	Since Co High	empilatn Low
Government Secs.	79.76	79,89	80,17	80.15	79,80	79,95	83,77	75,72	127,4	49.18
Fixed Interest	83,36	88,29	83,45	83,34	83,19	88,24	87.48	80,43	150,4	50.53
Inditatrial Ord	856,6	885,2	841,6	8.988	833,2	838,3	922,8	755,3	9,520	49,4
Gold Mines	570,9	578.4	570,2	562,6	8,878	578,8	711.7	485.7	784.7	43,5
FT-Act. All-Share	613.11	510,12	513,91	610,64	557,36	508,55	536.71	464,84	636,71	: 61.92
	1007.0	1097.0	1000 2	1089 4	1074.4	1078 0	11416	086'0	1141 6	095 0 3

BOARD MEETINGS

Spectrum Group (Leisure) Sioddard (Hidgs) 10peCumCnv RdPf (Textiles).

ment Sterling Issues)
Pacific Sales Organisation

(Industrials)

ł	are interims or finals and the	aub-	•
	divisions shown below are	based	
1	mainly on last year's timetable.		•
1	TODAY		
ı	Interims:—American Trust.	Dufay	,
ı	Bitumastic, Edinburgh Fund Mar	180eré	
1	i First Scottish American Trust.	Gaz-	
1	funkels Rastaurants, Hongkons	and	ı
1	Shanghai Banking, International	Thom-	
1	Son, Taylor Woodrow.		
	Finals:—Associated Deiries,	Heele-	
ł	mat, Jantar, Sangere.		
	FUTURE DATES		
	Interims:—	_	
	AC Cara	Sept 6	ì
		Sept 8	
1	Brooke Street Bureau S	Sept 4	
1		Oct 8	ì
	Inchcape	Sept 27	ľ
	Landon United Investments	Sept 12	
		Sept 14	
ı	Molynx	\ug 31	
i		Sept 4	ļ
1	Peninsular & Oriental Steem		
3	Navigetion	Sapt 5	i
Į	Pantos	Sept 8	
. [Phoenix Assurance	Sept 17	ı
1	_ Finals:—		
ŀ	Compco	\ug 29	
ł	Ferry Pickering	Sept 27	
Į	Heath (Samuel)	Sept 7	ř

LADBROKE INDEX Based on FT Index 835-839 (+6) Tel: 01-493 5261

هكذا مية النصل



E Paris

DENDS

: 41

£35m orders for Aberdeen Construction

ABERDEEN CONSTRUCTION valued at £3.lm; and one for £2.lm to build 116 houses at contracts worth £35m to subsidiaries. Largest single contract, valued at almost £7m, has been awarded to Reema Construction of married guarters at Howe Barracks, Canterbury, for the PSA. Reema has also been awarded a contract at Andever for housing contracts by Aberdeen the Test Valley Council, other contracts and one for £2.lm to build 116 houses at Clydesdale Bank, and advance factory extension to the Mallaig Harbour for the Mallaig Harbour for the Mallaig Harbour Authority. Other contracts include additional civil and the Scottish Development at the Shell/Esso gas terminal at \$1.4m and has begun a £1m extension to the Mallaig Harbour Authority. Other contracts work on a grade started work on a grade starte

Design and build for Shepherd

Five design and build contracts ampton is a £2.3m contract for As part of major expansion plans ing a further 1.000 containers. The building is 225 metres long five shoulding in the building is 225 metres long five shoulding five shoulding in the building five shoulding five with a total value over £7.5m have been won by SHEPHERD DULLDING SERVICE. All five to site commences in September for completion in August 1985.

RODIME has signed a contract with the data systems division of Convergent Technologies, Santa Clara, California, that is estimated to be worth over \$5.5m (\$4.2m) over an 18 month period Rodine will supply model 202E, a high performance 5.25" in Winchester disk drive with 20 Megabytes of formatted storage. Convergent Technologies will Two contracts, together worth over £1m, for altering and fitting out office buildings have been awarded to MYTON — part of the Taylor Woodrow Group. The larger, worth £680,000, involves forming and fitting out new offices, a kitchen, restaurant and lounge at the offices of Access in Priory Road, Southend. The work is scheduled for completion in November, 1984. The other contract, valued at £370,000, has been awarded by Svenska Inter-

CRITTALL WINDOWS has won a £600,000 order for the new British Embassy in Saudi Arabia, which is being built in Riyadh and to replace the old one at Jeddah. Crittall, a mmeber of the Norcros group, is supplying aluminium and steel windows and doors, together with sunbreakers and other ancillary components, and the glass and glazing materials.

**TOUGH BUILDING has to more than the place of the construction of the constructi

WEEK'S FINANCIAL DIARY

The following is a record of the principal business and financial engagements during the week. The board meetings are mainly for the purpose of considering dividends and official indications are not always available whether dividends concerned are interims or finals. The sub-divisions shown below are based mainly on last year's timetable.

VESTERDAY
BOARD MEETINGS Pengkalen Thomas Nationwide Transport Dividend & Interest Payments— Amdahi Scts Hoghes Tool 12cts Lennons 0.75p Hoghes Tool 12cts
Lennons 0.759
TOBAY
COMPANY MESTINGS—
Moorgate inv Tst, 1 Brewer's Green,
Buckingham Gate, 5w, 2.30
Swan (Lohn), New Mart Road, Gorgie,
Edinburgh, 4.00
BOARD MESTINGS—
Finals:
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Edinburgh Fund
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Bank of Ireans Fire Nate Cap No. 530-93
Bankaherica 38cts
Bankaherica 10-45
Benjam Bank AS Fire Rate Cap Nts 1989
\$30-53
Berry Tet Alepconelin 1993 2-lace
Brascan Class A Can Nov 40-cs
Burman Class A Can Nov 40-cs
Burman London Can 991-96 2-lace
Combined English Stores 9-pocla 1986191

Auronite 1.49
Cisna Overzeas Finance NV 13ecLa 2008
Cisna Overzeas Finance NV 13ecLa 2008
Cisna Overzeas Finance NV 13ecLa 2008
Cisna Overzeas Fish. Do A Non-Vvg 6.50
Cohen (A.) 6.50. Do A Non-Vvg 6.50
Electricite de France 12-pcGcdLa 2008
CRCp 8 succ Do 12-pcGcdLa 2008
CRCp 13-pc 1955
Corried Succ 13-pc 1955
Corried Success Auror 15-pc
Security Services 4-pcf 1.575p
Swan (John) 8.50
Security Services 4-pcf 1.575p
Swan (John) 8.50
Security Service 4-pcf 1.575p
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Values. Firederske, Place, 6C. 12-D0
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Manchester, 10.50
Energy Finance and General Tst. Dauster
Values. Firederske, Place, 0d Jewry, EC.
Holles. Windson House. Southmoor Read.
Wythenshawe. Manchester, 9.30
Jones (Edward), 2, Oueen Anne's Gate
Buildings, 1-2 Dartmouth Street, 5W,
10.00
EDARD MEETINGS—
EDARD MEETINGS—
Interings

American led Sabcock Intol
Dewhurst (I. J.)
Refuge Assurance
Slough Ests
Stanley (A. G.)
Wolr Gre

Statiet ran boy
Welf Gry
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STATISTIC PAYMENTS—
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TITOGROFTON TO 2.75p
COMPANY MEETINGS—
STATISTIC PAYMENTS TO
COMPANY MEETINGS—
STATISTIC PAYMENTS PAY Sriguol Evening Post, Temple Way, Brisbol, 12.00
Detmar. Manor Royal, Crawley, West
Sussec. 10.00
Lethan James). Leeside Wharf, Clapton. E.
Lendon and Midland Inds. Royal Lancaster
Notel, Lancaster Terrace W. 12.00
London and Oversees Freighters. Battle

E. 11.00 Milbury, London Press Centre, New Street Square, EC, 17.00 MMC Invs, 25-55, City Road, EC, 12.00 REA, Old Rectory, 29, Martin Lane, EC, NINC 1 1982 1983. City Road, EC. 12.00
1EA. Old Rectory. 29, Martin Lane, EC.
11.30
Recallan Properties. Washington Hotel.
Curron Street. WC. 3.00
Vinten. Angel Hotel, Bury St. Edmunds.
Suffolk. 12.00
BOARD MEETINGS—
Fluids:
Thinking
Hotel Bury St. Edmunds.
Suffolk. 12.00
BOARD MEETINGS—
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The and lay
Moran Tea
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Tellance Ind
Stewart Plastics
Whitworth Elec
Interiess:
Charterhouse Pet
Hohlands and Lowlands
Home Countles Newspaper
Johnson Gry Cleaners
Lor Retrisperation
London and Scottish Marine Off
Hobic and Lund
Pentiand Inds
Robbisson (Thomas)
Scottish Apri (nds
Stat-Pius
U.S. Deb Con
Home

Liverpool Street EC. 11.45
Davoonort Knitwear, Allen House, New-mark Street. Lexcater, 11.30
Mortev (R.N.). Carolina Bank, 26, Austin Friars. EC. 12.00
Ressell (Alexander), Royal Scottich Auto-mobile Clab. 11. Birthrawood Square.
Shaw Carona Post House. Ossert 12.00
State Carona Post House. Ossert 12.00
Trans. Socient's Inn. EC. 3.00
BOARD MEETINGS.

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Alexanders' Hidgs
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Schrifts Mitods Absc
Schrifts Mitods Absc
Schrifts Nihrb Inv Tit
DIVIDEND & INTEREST PAYMENTS—
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Allied Leather Inds 3.75p
Allient Loncon Properties 104;sc1s:httgDb
1884-99 Sauce
Alking Bros (Hoslory) 51;scPT 1,925p
Bank of Ireland Fig Rate Cap Nis 1989
\$30.93
Bankamerica 3.8cts
Bankamerica 3.8cts
Bankamerica 3.8cts

Combined English Stores Depart 1900.0.

4 lact
Continental and Industrial Tst SpcRedDb
1980-85 2 Lpcc
Danat Inv Tst 2.73p
Delmar 1.65p
Derby Tst 3.162p
Derby Tst 3.162p
Danyr 7.6ctn 1986-91 3 lpcc
Daport 1.75p

Downty 7pt.Ln 1986-91 Since
Duport 1.75p
Ecclessastical 13oc05 Since
Empressa La Moderna SA de CV Fito
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Energy Finance and General Tet 0.71p
Evans of Lectes 1,750 as Apr
Eved Socosta 1,750 as Apr
Eved Intel Inva. N Edd Fito Rate Nts
1986 S546-25
Foster Gros Clothing Si-pcP 1,925p
Foster Gros Clothing Si-pcP 1,925p
Foster Gros Clothing Si-pc Nts 1987
S276-32
Grant Clamas (East) 7-lpc1stMtpDb 1991
1995 Structure Telegraph (Er) DKr 6.48
Foster Gros Clothing Db 1986-91 Si-pc
Growbeld (0.25p
Gottric 7-lpc1stMtpDb 1986-91 Si-pc
Intelsam Leisure 2.6a
Investors in Industry 8-pcLn 1992-97
4-lpc
Invicta Gilt Income Fund Ptg Red Pt 30p mestor in Industry 4 Just 4 August 4 August 6 August 6 August 6 August 7 Au

540 Invicta Gilt Growth Fund Ptg Red Pf 25p JWT 35cts JIMT 35cts
Johnson and Firth Brown 11pcln 1993-98
4-58cc
Kirsh Trading 2nd 5cre 5cts. De 3nd5pc
Pf 5cts. Do 8pcPf 5cts. Do 5pcPf 5cts
Kielnwort, Benson Gilt Fund Ptg Red Pt
27-339

1987-92 313 Kpc. Do 9pcln 1999-2004 1987-92 319pc. Do 9octa 1999-2004
4/pc
River Plate and Gen Inv Tst 5ocPfd fl 75p
Romee Tst 1.5p
Rome Evans Invs 1.35p
Romee Evans Invs 1.35p
Romee Evans Invs 1.35p
Romee Evans Invs 1.35p
Romee Evans Invs 1.35p
Russell Alexander J.72p
Scott and Robertion 7-pclus 1985-90 3/spc
Scottish Mortgage and Tst 5pcPf 1.75p
Show Carperts 5-bocPf 2 dp
Shain Pits Rive Nts 1983 \$54.63
Steinberg 1.2p
Swedon Fig Rate Nts 1983 \$543.06
TR Australia Inv Tst 7pcDb 1997-2002
3/pc

21

TR Australia liv 1st 70c00 1997-2002
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1ravis and Arnold SpcLn 1987-93 31i-pc
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1980-85 31-pc. Do 7-pcDb 1986-91
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USAM 5ncDh 1980-85 21-pc. Do 7-pcDh
1980-85 31-pc. Do 7-pcDb 1986-91
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USAM 5ncDh 1980-85 21-pc. Do 7-pcDh
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1980-91 4 Usaker abd Attionon 9pcLn
1980-91 4 Usaker abd Attionon
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BOARD MEETINGS—
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American Serands 93.75 ds
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East Worrestershire Waterwarts 3.5ac emit 5ac) Mar 1.75a. Do 7ac imile 10cc Mar 3.5a. Do 2.8ac imile 4acl (1953) P 1.4a. Do 2.8ac imile 4acl (1941) P 1.4a. Do 3.8bc (imile 4ac) (1941) P 1.4a. Do 3.8bc (imile 5ac) P 1.925a This is the second of the seco M and G General Tst Fund 6.20
Metropolitan Warer 3pc 8 /1934-2003
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Lin 21/pc
Monathia SocGrain 1983-86 21/pc
Octhom Met Borouch Council 11-25ocRed
Politation Oriental Spoam Nav SocPid
11/pd 100 30/pc 100 Perp 14/pc
Port of London Authority 61/pc/Reg 19871990 Zupc
Rediand SocPy 2.5p
Red 2pc
Scheder J.) Boc Irrdin 4ac
Salford Corp 51/pc/Red 1926-86 24/pc
Schroders Giroch 1890-85 34/pc
Schroders Giroch 1890-85 34/pc
Schroders Giroch 1890-85 34/pc
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1/pc
1/pc/D1/pc/Db 1984-80 3/pc/

Scottish Agric Sec Corp 3 hpcBb 1979-84
1 hac
Spillers 7 fuscDb 1984-89 3 hac
Spillers 7 fuscDb 1984-89 3 hac
Spillers 7 fuscDb 1984-89 3 hac
Db 1985-91 short Db 6 hpc Db 1985-94
Db 1985-91 short Db 6 hpc Db 1985-94
Japac, Db 7 lpc Cb 1995-97 3 hpc. Db 6 hpc
Db 1985-91 short Db 6 hpc (maly Bpc)
Bpc) Max 38p Db 3 spc (maly 8pc) Max
New 17-5p Db 5 8pc (maly 8pc) Max
New 17-5p Db 5 8pc (maly 8pc) Max
New 17-5p Db 5 8pc (maly 8pc) Max
Prd 28p Db 28pc (maly 8pc) Max
Prd 28p Db 28pc (maly 8pc) Pf 14p.
Db 4-2pc (maly 4pc) Pf 14p.
Db 5-18pc (maly 4-pc) Red Pf 7-87-5p.
Db 5-18pc (maly 4-pc) Red Pf 7-87-5p.
Db 5-18pc (maly 4-pc) Red Pf 1993-96
2-2-0-125d 5-pc-Red Db 1981-86 2-hpc. Db
Shape Db 7-18pc Red Pf 1993-96
Shape Db 7-18pc Red Pf 1993-96 Pf Scts. Do SpcPf Scts. Do SpcPf Scts. Kleinwort. Sension Git. Found Ptg. Red Ptg. 27:33p.

Kleinwort. Sension Git. Found Ptg. Red Ptg. 27:33p.

Kynoch CC and Gi 61:pcRedPf 2:275p.

Leda inv Ta. 2.10c. Inv Tel. 0.2p.

Jan. Do 71:pc Dh 1992-95 3.0c. (Inv) Spc. Do 6.10c. Do 71:pc Dh 1992-97 3.3pc.

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Lin 1997-3.1pc. Do 3.pc. (Inv) 5.pc. Ptg.

Wider OAP rail travel urged

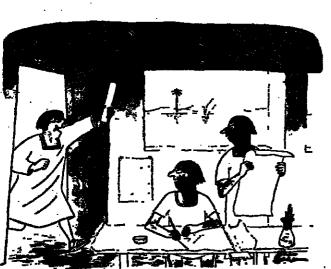
THE Greater London Council is urging the Government to allow British Rail to accept a pensioners living in parts of £2.5m offer from the council to London where there are good extend the GLC's free travel scheme for the elderly to BR's services but only limited bus and tube services.

Mr Dave Wetzel, chairman of the GLC's transport comintroduced half-price off-peak

of the GLC's transport com-mittee, saidff "We have bud-geted £2.25m in this year's GLC area for London's pen-

75.0 transport programme to give sioners. But this new scheme to firm Hotel. Uverpool 10 Great Eastern Hotel. London services.

Henry Boot to build £25m Work in the Hong Kong container depot north for



"We got it! We got the pyramid contract!"

English Estates has awarded a tion of a new type of mechanised contract worth \$500,000 to KASS letter sorting office in Ipswich.

Drawing by Chas. Addams: © 1984 The New Yorker Magazine, Inc.

Wanted

portation. In a £224,047 contract, a low level water storage tank will be built at Selkirk for the Borders Regional Council and, at Cockermouth, £32,756 will be

spent by Cumbria County Council for alterations to the Grammar School and Derwent School.

HOUSEWARES COMPANY REQUIRED

Contact ' Peter Cartwright 0384 66304

CORTON BEACH P.L.C. We are a rapidly expanding group of companies involved in food Manufacturing and distribution: now searching for a suitable acquisition.

We particularly seek Companies with a minimum net profit in wich a minimum net profit in excess of £100,000 per annum and capable of further develop-

Geographical location is not important and existing Management would be retained. All replies will be created in the stricture confidence. Please reply to:

Mr. M. Keen, Chairman CORTON BEACH PLC on House, 147a Sediord Road Southport PRS 4HR

WANTED

PHOTO PROCESSING: WE NEED MORE CAPACITY we are short of processing cepacity.
Any photo processing teboratory
that is short of business or creatfor expansion please write to:
Box 010009, Financial Times
TO Cannon Street, London EC4P 48Y

UK COMPANY wishes to acquire established profitable business in industrial Sefety Security or Sits Mentanance field A manufacturer or distributor is cought with a surmover between 20.5 million and 25 million.

Clubs

Businesses

REIGHT FORWARDING COMPANY WANTED

blisbed freight forwarder wit size of company, turnover required range 23m to 220m with up to 23m available for equity purchase. All replies treated in strictest confidence.

Write Box G10017, Financial Times 10 Cannon Street, London ECAP 48Y

Company Notices

TENDERS FOR GREATER LONDON BILLS

J. E. G. CROCKFORD Director of Finance

Art Galleries

AGNEW GALLERY, 41 ON BOND SE, WI 01-629 617E, VIVIAN PRICEPORTH, RA -- TOTAL WILLIAM STATE 14 Sept MOD-FT, 9-30-330.

Distributor Agents. Details plaase to be held in strictes confidence to Chairman Box G10008, Financial Times 10 Cennon Street, London EC4P 4BY

U.K. Food

INVESTOR

wants to purchase Plastics Moulding company with factory working in G.R.P. Ample funds available and existing jobs secured. Write Box G10014, Financial Times

has funds available to purchase companies involved in transport companies involved in transport distribution, road haulage, plant hire. Please reply to investor. All replies will be acknowledged. Write Box 69994, Financial Times 10 Cannon Street, London EC4P 4BY

U.K. Company

Contracts & Tenders

Registration of Interest

STUDY

of need for and means of accommodating large ships for export coal at NSW ports (AUSTRALIA)

The NSW Coal Association and the Maritime Services

Board of NSW are seeking registration of interest from suitably qualified consulting organisations to undertake a major study of the future need for and means of modating large ships for export coal at NSW ports. The study is an extensive investigation of the economics of the use of large ships in the NSW export coal trade and the technological aspects of accommodating large ships at NSW ports.

Organisations wishing to participate in the study must demonstrate their ability to undertake the necessary detailed assessment of the transport economics factors and the technological and engineering factors affecting the use of large ships in the NSW export coal trade. Registration of interest may be made and study terms of reference obtained by writing to:

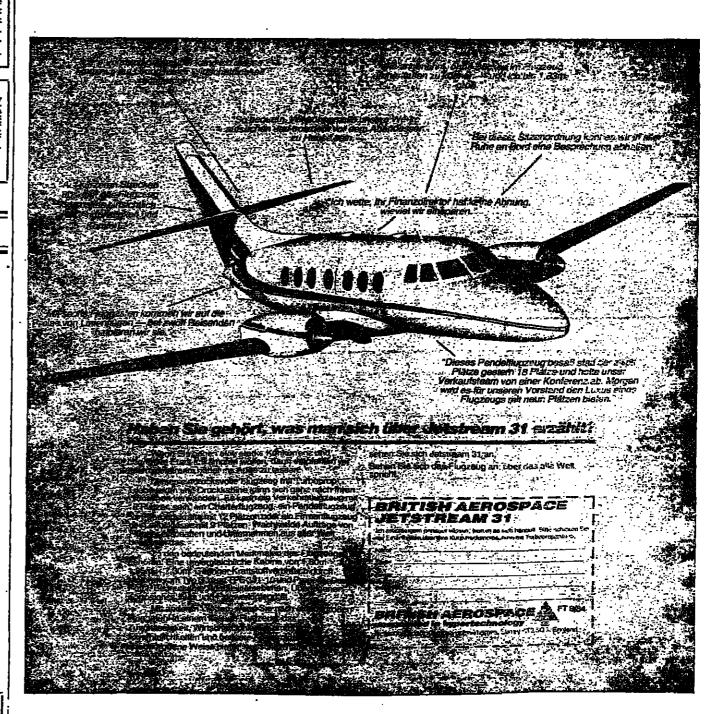
> Mr. W. A. Bennett Secretary, Transportation Committee NSW Coal Association P.O. Box Q339, Queen Victoria Building Sydney, NSW 2000, AUSTRALIA Telephone: (02) 29 7202

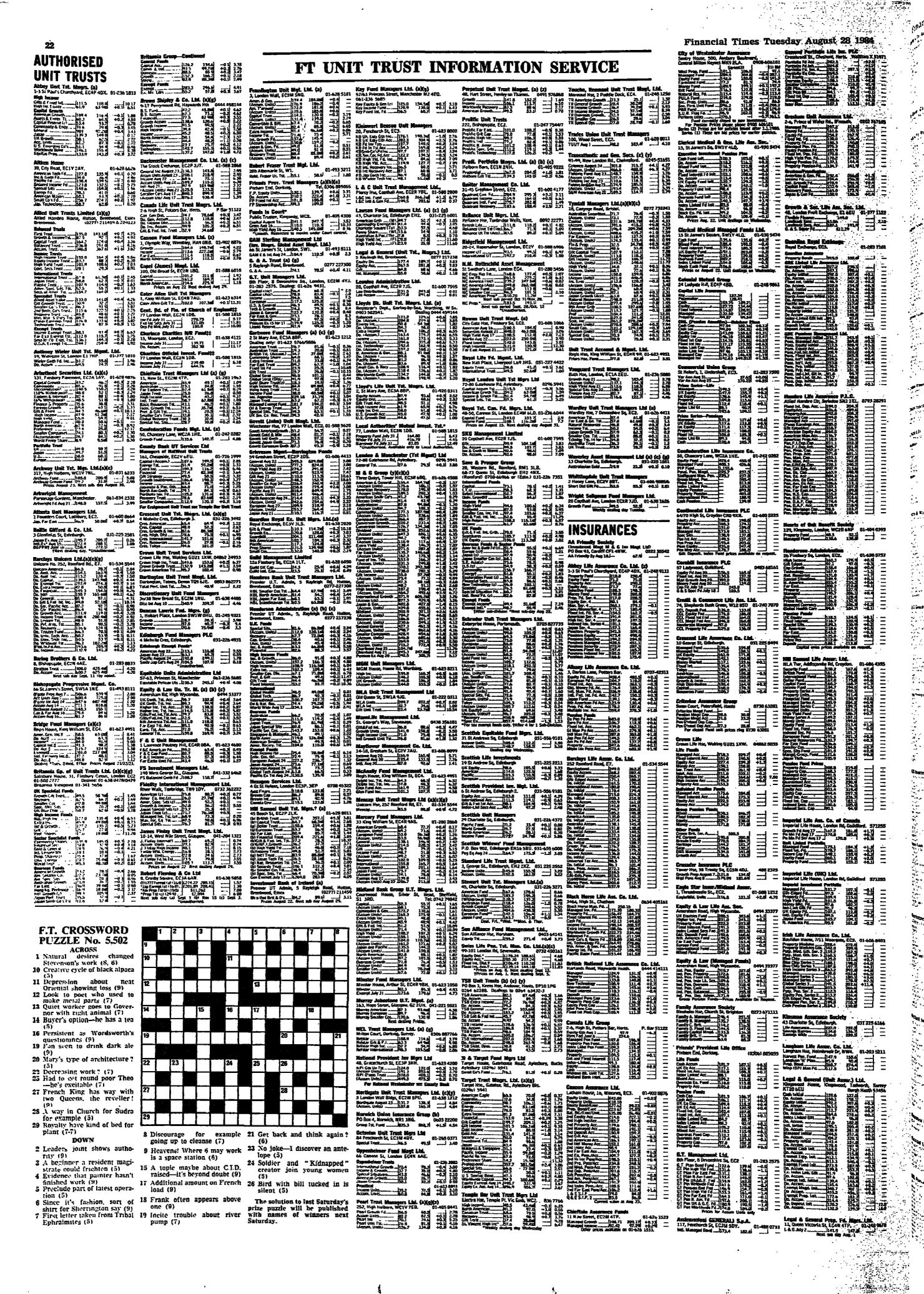
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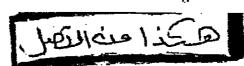
LEEDS AND BRADFORD AIRPORT JOINT COMMITTEE

NEW DUTY FREE SHOP

Applications are invited from suitably experienced organisations Applications are invited from surfably experienced organisations wishing to be considered for the operation of a new Duty Free Shop concession, to be opened early next year in the Passenger Terminal extension at the rapidly developing Leeds Bradford Airport. Written applications should be submitted to the Director of Industry & Estates, Leeds City Council, Headrow Buildings, 44 The Headrow, Loads LS1, by 17th September 1984 for the attention of Mr. Dishaus. of Mr N Ellaby.





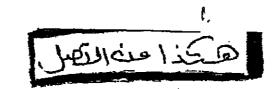


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Financial Times Tuesday August 28 1984 23 **INSURANCE, OVERSEAS & MONEY FUNDS** 4052 5.52 CHibank (C) Lbd "Citifunds"
Green Street, St Felter.
U S S Fand Street S Co. Ltd "Citicare" Citicare Fund Aury 15 J 10 587 \J — Tyndali Assurance/Pensi 18, Carrynge Road, Bristol. 0272 732241 Bristol, BS1 6EA. 0272-279179 Providence Capital Interior PO Box 121, 5t Peter Pt, Gue 0702 333433 776.2 2776.2 2776.2 1159.0 1125.7 232.4 232.4 247.1 141.9 447.1 249.7 225.0 216.4 195.4 365.0 161.0 271.2 211.5 Holborn Fund Blagt, (Jersey) Ltd. 28/14 Hill St. St. Helier, Jersey. 05 Vantruck Currency Food Ltd. Vanhrugh Life Assirtance
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Fbest int. Fd. 254.9 58.
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Cash Fd. 180.3 17. \$1.3942 \$1.0077 \$1.1438 \$0.8992 \$22.59 1541 +0.1 1541 +0.1 1508 +0.6 87.8 -0.4 142.6 ---142.6 ---157.4 +2.0 157.4 +2.0 157.4 -0.8 157.5 -0.4 155.2 +1.9 162.5 -0.4 OFFICIAL AND OVERSEAS OF THE PROPERTY OF THE P nce Capital Life Assc. Co. Ltd.

Medicus	FT LONDON SHARE INFORMATION SERVICE	R	HOTELS Dividends Stack	Lugust 28 1984 —Continued Continued Vel V
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BRITISH FUNDS	May Au No Flamer: Nat. Res. S1 25-110 7 1831.41 4.1 Ap. y 0. Jalamerican T. & T. \$1. \$1. \$1. Ap. y 0. Jalamerican T. & T. \$1. \$1. \$1. \$1. \$1. \$1. \$1. \$1. \$1. \$1	30.1 2.0 ♦ 5.8 ♦ 3.1 16.7 2.7 5 1.1 18 8.9 8.3 16.7 2.7 5 1.1 18 8.9 8.3 16.7 2.7 5 1.1 18 8.9 8.3 16.7 2.7 5 1.1 18 8.9 8.3 16.7 2.7 5 1.1 18 8.0 18 18 18 18 18 18 18 18 18 18 18 18 18	Oct. Agr. Harmson Bros. 10p. Mar. Oct. Abbry Ltd July Abertoyle Hidgs. 8p Jan. June Hanney Sarvices 10p. RAIS-Laut ABP Sico. Ang. Sept. Arrhog Indis. Amer Group File20. February Peng. Airchar Fin Fig. May Oct. Angle Rordet Jan. Sug. Arrhogs Rordet Jan. Sug. Arrhogs Rordet Jan. Sug. Arrhogs Oct. 3 10p. Apr. Oct. Asintay Ind. 19t. Jan. July Assoc. 8 Dept. 12tg. May Nowlesson & Dept. 12tg. May Nowlesson & Dept. 12tg. Jan. July Assoc. Energy 5p. Jan. Landary Rod. Services. Decomber Assoc. Telecom Decomber Assoc. Telecom Oct. June Asinty & Madesy 8p. Jan. July Assoc. 10p. Jan. July Ball. Group	Symilar Sym
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Mar Sept Water 100	PERTY Page 1 Steel	NCE, LAND Last Bir Yes Feb. JulyArroys Smithers Amaigumated F. Inns. July Mov. Anticopean Hilds: Cl. July Do. 5% Care Per Cl.	160 12.3 14.5 16.5 1.9 5.4 10.8 17.5 16.5 1.9 5.4 10.8 17.5 16.5 1.9 5.4 10.8 10.5	Control Cont	per value. See French Francs, §§ Yield based on assumption the process of the stays unchanged until meturity of stock, a Tos free the stays unchanged until meturity of stock, a Tos free the stay of
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Agr Oct 10. 13pc Cas. \$1.00 £56 17.38 011% 11.19 11.	123 2.7 2.0 2.9 3.16.6 Sept. Aprilange-int Div	246 16.7 5.35 1.0 3.1 June Dencan (W.) & G (1) 65 [27.2 \$76.5 1.0 15.0 April #Erinbroh Fd Man So	2892 — — — — — — — — — — — — — — — — — — —	Far West Rand 55	effer pending scrip and/or rights issue. If Dividend and yield protopicus or other official estimates for 1944. If Paires based other or official estimates for 1944. If Dividend and yield based octor or official estimates for 1985-85. If Dividend and sol on prospectus or other official estimates for 1985. If Figures prospectus or other official estimates for 1985. If Gross, i assumed. 2 Dividend total to date. Instituted. 2 Dividend total to date. Idea: If ex dividend; If ex scrip issue; If ex rights; Iff ex als; that distribution.
Jan. July Sen. Accident 468 14.5 19.9 6.0	525 26.3 Ap 3.1 3.912.0 Baltile Gifford Tech.	356 2.7 17.0 (0.9 2.8 October #Framington Grp. 37 4.6 0.88 1.1 3.4 Jan SeptFrest U. J. & D 106 1.2 9.0 1.	725 9.11 96.5 6.8 1.216.5 Feb. Aug. Extensy 90 16.7 2.3 \$\overline{0}\$ 3.7 \$\overline{0}\$ Feb. Aug. Kloof for 127m13.8 6.12 \$\overline{0}\$ 6.9 \$\overline{0}\$ Feb. Aug. Kloof for 2432 - Feb. Aug. Libanon 15 24.6 Q106 1.2 4.618.0 Mar. Aug. Southea.	RI 251 D0.7 registed 1.0 6.0 st 10c 526 2.7 02726 0 6.4 RE 1 534-2.7 0236c 0 4.5 RE 1 528-2.7 0256c 0 5.7 The folio 0 50c 528-213.8 100-55 1.0 1	GIONAL & IRISH STOCKS mang is a selection of Regional and frish stocks, the latter being quoted in Irish currency.
Nov. June Miner Highs. 20p . 175 14-5 5.18 2.2 4.213.7 October County Props & Oct. June Prop Part 5p . 879 30-4 733.0 - 5-4 - June Row Coston Prop. 679 . 67	96613.8 1.55 0 11.2 0 Apr. J. British Assets	30.4 3.13 1.3 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3	24 18.6 hd0.963.4 i 5.777.3 re. Mar. Sept.Western 65 18.6 2.0 2.1 4.4.15.4 Mar. Sept.Western 29 12.3 0.35 2.3 1.735.9 23 12.3 0.35 2.3 1.735.9 23 12.3 0.35 2.3 12.3 2.28.5 138 18.6 11.0 2.2 11.4 5.7 Mar. Sept.Free Stz	CS R1	1985 E985
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April Vraibbo Ni CDR	230 13.2 4.0 6 2.5 6 151 19.4 15.5 2.8 5.2 8.4 15.5 2.8 5.2 8.4 18.6 5.2 8.4 18.6 52.3 2.0 4.9 17.5 19.6	340,226.3 3.3 1.0 13.3 March Mexico Furd Inc	214 15 A July 142 July July July Ang. And	Bahcock. Finance PSA \$1.50. 112 27.2 07.5c 4.4 3.1 01secham. Coal 50c. 517 4.6 0145c 3.1 4.0 00st. Ber, 10c. 511 2.7 0120c 2.0 5.1 00waters.	12
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Mar. Nov. Hell Facolies 19p 48 19.11 2.1 4 6.5 6 Dec. Lone MEPC	110 304 09.79 0.9 12.714.51 Dec. JulyEng. & Internation 12.714.51 Dec. JulyEng. & Internation 14.5 Dec. JulyEng. & Ny Trust. 12.7 Dec. AprilEng. & Ny Trust. 12.7 Dec. JulyEng. & Ny Tru	527	70 12.3	c 91.85 775 12.7 92009 × 14-1 This sum	rice is available to every Company deaft in on Stock is throughout the United Kingdom for a fee of £700 per annum for each security.

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EUROPEAN OPTIONS EXCHANGE

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CURRENCIES, MONEY and CAPITAL MARKETS

A general lack of direction

BY COLIN MILLHAM

FOREIGN EXCHANGES

The dollar drifted around moved to the minutes of the above the expected unchanged without showing any definite direction last week. By the end of day, although once again these enough to create thoughts about the week trading was so thin that few traders were prepared any surprises. that few traders were prepared to take new positions in a very nervous and volatile market.

Economic figures released above expectations and taken to take not experience and to ta were generally inconclusive and failed to inspire any trend. A revised rise of 7.5 per cent in U.S. second quarter gross national product was so close to

the earlier revision of 7.5 per cent that it was virtually ignored, while the market also failed to become excited by the

THE POUND SPOT AND FORWARD

3.74'-3.77 196.50-198.40 214.40-216.00 2.319-2.332 10.78-10.85 11.50'-11.57 10.63'-10.91 374'-375 26.35-26.50 3.12-3.14 Belgian rato Is fo

OTHER CURRENCIES

Argentina Peso | Y92,92,93,08 | 71,10-71,18 | Austria Dollar | 1,5275-1,5385 | 1,1685-1,1695 | Belgium | 2,052 2,062 | Friland Markku, 17,8660-7,8980 | 6,0395-6,0415 | Denmark | Frince Greek Prachma | 150,90,151,20 | 115-115,30 | Gormany | Hong Kong Dollar | 10,2580-10,280 | 18,70 | 90,70 | 12aly | Japan | Ja

* Selfing rate.

Changes are for Ecu. therefore positive change denotes a week currency. Adjustment calculated by Financial Times.

from central rate

adjusted for divergence

EMS EUROPEAN CURRENCY UNIT RATES

A rise of 2.2 per cent in July U.S. durable goods orders was above expectations but had little impact. The market had been vised fall of 3 per cent in June, but was more concerned about August meeting of the Federal lower. There was also some discover Market Commit(A).

No change in policy was expected, and attention then prices. This was only slightly

-0.92 0.32-0.37dis -1.34 0.52-0.65dis 4.79 5-4*pm -0.32 1-11dis -0.38 2-3dis

Note Rates

Divergence limit %

±1,5447 ±1,8425 ±1,0642 ±1,4064 ±1,6629 ±4,1505

On the other hand the high

level of Federal funds in New York underpinned the dollar to some extent, and the economic expecting an increase of about statistics were not bad enough 1 per cent, compared with a re- to put any real downward pressure on the currency. Against this background the dollar the breakdown to arrive at the showed signs of improvement at final figure. This showed that the beginning of the week, but when non-defence work was then fell back before rallying excluded the result for July was to some extent on Friday in a very thin market.

By this time sterling had move

towards the centre of the stage. London interest rates still look competitive despite the recent cuts in base rates and the pound was also supported by firmer world oil prices. But as the week ended another national dock strike was about to start, with possible damaging consequences for the UK economy.

£ in New York Aug. 24 31,3065-3075 \$1,3115-3130 0,08-0,10 die 0,09-0,11 die 0,32-0,36 dis 0,35-0,39 dis

FORWARD RATES AGAINST STERLING 3 month 6 month 1.3101 1.3143 3.7009 7.6602 11.5608 1.0388 3.0388 311.54 308.24

BANK OF ENGLAND TREASURY BILL TENDER | Aug. 24 | Aug. 17 | £100m £100m

THE DOLLAR SPOT AND FORWARD | 1,3055-1,3115 | 1,3060-1,3070 | 0,08-0,12c dis | -0,32 0,32-0,37dis | -1,3075-1,0755 | 1,0735-1,0745 | 0,09-0,04c pm | -0,22 0,32-0,37dis | -1,3260-3,2360 | 2,3260-3,2400 | 0,56-1,53c pm | -0,57 0,22-0,18pm | 0,09-0,04c pm | -0,57 0,22-0,04c pm | 0,57 21-2pm | 0,62 12-10pm | 0,57 21-2pm | 0,57 2 p.a. morms

-0.92 0.32-0.37dis
-0.72 0.28-0.18pm
-0.51 0.09-0.12dis
5.72 4.35-4.49pm
0.52 12-10pm
0.57 2'-2pm
6.54 4.55-4.90pm
-25.82 425-1150dis
-1.69 93-103-dis
-1.02 1.25-1.75dis
0.61 0.90-0.70pm

CURRENCY MOVEMENTS CURRENCY RATES 77.8 136.1 90.0 114.1 90.0 77.5 123.8 143.1 113.4 47.6 165.4 1980-1982 = 100. Benk of England Index CS/SDR rate for August 23: 1.3229 (base average 1975-100).

EXCHANGE CROSS RATES

central rates

Agian Franc ... Anish Krone ...

	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									•
Aug. 24	Pound St rling	U.S. Dollar	Deutsche m'k	J'par es : Yen	FrenchFranc	Swiss Franc	Dutch Guild	Italian Lira	Canada Dolla	r Belgian Fran
Pound Starling	1.	1,807	3,750	815.0	11.53	3.125	4.230	2321.	1,695	75,70
U.S. Dollar	0,765	1.	2,873	241.1	8.822	2.393	3,239	1778.	1,298	57,98
Deutschemark	0.267	0,348	1.	84,00	3.075	0.833	1.128	618,9	0.458	20,19
Japanese Yen 1,000	3,175	4,148	11,90	1000,	36,60	9,921	13.43	7368,	5,381	240,3
French Franc 10	0.867	1.133	3,252	275.2	10.	2,710	3.669	2018.	1.470	65.65
Swiss Franc	0.320	0,418	1,200	100.8	3,690	1,	1,354	742,7	0.542	24,22
Dutch Guilder	0,236	0,30 9	0.887	74.47	2.726	0,739	1.	548,7	0.401	17.90
Italian Lira 1,000	0,431	0,563	1.616	136.7	4.968	1,546	1,822	1000.	0,730	38.62 .23
anadian Dollar	0,590	0.771	2,212	185.8	6,802	1.844	2.496	1369.	0 070	44,66

EURO-CURRENCY INTEREST RATES (Market closing rates)

Aug. 24	Sterling	U.S. Dollar	Canadian Dollar	Dutch Guilder	Swiss Franc	D-mark	French Franc	italian Lira	Belgia Conv.	n Franc Fin,	Yen	Danish Krone
Short term	107g-1114 11-1114 107g-11 107g-11 107g-117g 107g-117g	11点 11倍	12.12.3 12.3-12.4 134-13.5	5 : 6 5 : 6 6 : 6 g 6 : 6 3 6 : 6 4 6 : 6 :	25, 21 ₂ 21, 23, 51, 55, 51, 51, 5, 5, 5, 5	54 55g 54 53g 54 63g 54 63g 57g 6 614 63g	107g-111g 107g-111g 11.1-11.7g 11.5-11.7g 12-1214 12-1214	134-144 1114-1234 1346-1376 1418-1456 10-1518 1556-1618	11½-12 11¼-11¾ 11-11½ 11-11½ 11-11½ 11½-12	114-114 114-114 1118-115 11-114 11-114 1118-115	61g.614 613, 614 613, 639 639, 613, 639, 613, 619, 613	10 ¹ g-11 10 ³ g-11 ¹ 11 ¹ g-12 11 ¹ g-12 11 ¹ g-12 11 ² g-12

Asian S (closing rates in Singapore): Short-term 11½-11½ per cont; seven days 11½-11½ per cent; one month 11½-11½ per cent; three months 11½-11½-12½ per cent; six months 12½-12½ per cent; one years 13½-13½ per cent; flow years 13½-13½ per cent; flo

MONEY MARKETS =

Change in sentiment

Sentiment changed quite sterling take the strain on the dramatically on the London exchanges if the dock strike money market last week. Interbank interest rates showed a its defence with another round

national dock strike added to market depression, and rates moved still higher, before yeaking at about 11 per cent.
Although the market was nerrous about the general situation there was no sign of panic Better than expected July UK trade figures helped the market keep its cerve, since the previous dock strike had been expected to have a worse impact on exports than proved to be the case.

Another factor in market psychology was the very recent cuts to 10; per cent from 12 per cent in base rates and the obvious wish of the authorities to get rates lower if possible. It was reasoned that in the present circumstances the Bank of England was more likely to let

FT LONDON INTERBANK FIXING

LONDON INTERBANK FIXING (11.00 a.m. August 24) 3 months U.S. dollar

bid 11 13 16 | offer 11 15:16 6 months U.S. dollars

The fixing rates are the arithmetic meens, rounded to the nearest one sixteenth, of the bid and offered rates five reference banks at 11 am each working day. The banks are National Westminatur Bank, Bank of Tokyo, Deutsche Bank, Banque Nationals de Paris and Margan Guaranty Trust.

New York fall to about 111 per cent from 111 per cent during

The market was also relieved minutes of meeting were not to see the Federal Funds rate in released until after the close of London trading on Friday.
Elsewhere interest rates were but by Friday the rate structure that changed to a flat level from care-month to one-year at about 11 per cent.

Rates began to move up as optimism about another imminent cut in clearing bank base rates evaporated. A localing national dock strike added to market damescales. the week. Last week's meeting fairly steady. As expected, the of the Federal Open Market Bundesbank council left policies unchanged at last week's regular meeting, and the Bank of France kept its money market interven-tion rate at 111 per cent when buying first category paper on

Paris Zurich Tokyo 112-2 478-5 6,15625 6,28125 154-165g 10.15 154-165g 111g-113g 5.51₈ 6,28125 1619-1678 114

Discount Houses Deposit and Bill Rates LONDON MONEY RATES Starling Cartificate of deposit Treasury (Buy) Sank (Suy) 111₄ 11-115 11.11%
10.10%
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10.21% 11 144 1054 1034 1019 10 10 % 10 % 10 % 114 104 104 104 105

Finance 8 Cert House of Deposits Deposits 11,5 11,8 11,35-11,65 11,8-11,7 11,63-11,95 1012-1016

MONEY RATES NEW YORK (Lunchtime) Broker loan rate Treasury Bills One month Two month Three month

U.S. TREASURY BONDS 8% \$100,000 32nds of 100% LONDON Close High
Sept 65-05 65-07
Dec 65-16 —
March 84-30 —
Est volume 606 (899)
Prévious day's open int THREE-MONTH EURODOLLAR Low 66-02 Close High Low Prev
Sept 88.43 88.44 88.42 88.41
Dec 88.06 88.09 83.05 88.03
March 87.72 87.77 87.72 87.72
June 87.52 87.57 87.48 87.48
Sept 87.31 — 87.28
Est volume 1,734 (2,247)
Est volume 1,734 (2,247) **CHICAGO** U.S. TREASURY BONDS \$100,000 32nds of 100% Previous day's open int 13,001 (13,120) THREE-MONTH STERLING DEPOSIT £250,000 points of 100% Lintest High 65-19 65-28 64-29 65-06 64-11 64-18 63-29 64-04 63-17 83-18 63-08 63-11 62-31 63-03 63-03 63-03 Close High Low Prev
Sept 89.57 89.63 89.55 89.63
Dec 89.64 89.68 83.57 89.63
March* 89.46 89.45 89.42 89.49
Junte* 89.20 89.22 89.20 89.23
Est volume 1,207 (2,333)
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FINANCIAL FUTURES

Vol. | Last Stock **58** -11 2 8 SILVER C SILVER C SILVER P SIFL C SIFL C SIFL C 0.50 10 8 5.80 B 3.30 1.50 0.80 1.50 232k 31 52 65 ABN C ABN P AEGN C AEGN P AH C AH P AKZO C A F.120.50 7 5 F,195,50 9,80 A F.93.30 6,30 5.60 P.56.60 F.161 GIST P GIST P HEIN C HEIN P HOOG C HOOG P 1,30 F.159.50 29 6 F.58.70 147 | 4,20 60 6.80 82 3.70 31 15.10 43 5.50 8 5.50 8 1 1.50 1 36 13 250 (F.177,50 F.180 F.170 F.110 F.120 F.220 F.210 F.2727 3 11 F.124.50 14.50 4.50 F.225 5 200 600 1 12 136 174 178 — — — 15 350 8 6.80 3.60 1.80 3 5,60 4,80 2,60 3,50 2 0.60 1.80 5.30 0.50 12.80 5.30 1.60 1.70 B 15.30 4.80 3.50 6.50 F.162.50 11.50 6.70 TOTBL VOLUME IN CONTRACTS: 14,490 C=Cali **HOME COMPUTERS FOR**

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WORLD VALUE OF THE POUND

The table below gives the latest available rate of exchange for the pound against various currencies on August 24, 1984. In some cases rate is nominal. Market rates are the average of buying and selling rates except where they are shown to be otherwise. In some cases market rates have been calculated from those of foreign currencies to which

DUBLIN

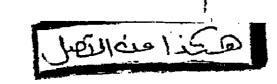
London—bend 1 bills mature in up to 14 days, band 2 bills 16 to 33 days, and band 3 bills 34 to 63 days, Rates quoted represent Bank of England buying or selling rates with the money market. In other centres rates are generally deposit rates in the domestic money market and their respective changes during the week. Band 4 bills 164.

AMSTERDAM

Abbreviations: (A) approximate rate, no direct quotation available; (F) free rate; (P) based on U.S. dollar parities and going starling-dollar rates; (T) tourist rate; (Bas) basic rate; (bg) buying rate; (Bk) bankers' rates; (cm) commercial rate; (ch) convertible rate; (fu) financial rate; (exC) exchange certificate rate; (no non-commercial rate; (nom) nominal; (o) official rate; (sg) selling rate.

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*Rate is the transfor market (controlled). ## Now one official rate. (||) Based on gross rates against Russian rouble. (1) Essential goods. (2) Preferential rate for priority imports such as foodstuffs. (4) Preferential rate for public sector debt and essential imports. (5) Preferential rate. (5) Free rate for imports, remittances of money abroad and foreign travel. (7) Perellel rate. (8) Rate for remittances of foreign currency by Egyptians working abroad and tourists. (13) Essential imports. (10) Rate for exports. (11) Perellel rate. (12) Rate for imports. (13) Essential imports. (14) Non-assential imports. (15) Nearly all business



10 July 58 184

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FINANCIAL TIMES SURVEY

Aerospace

The world's aerospace industries are slowly emerging from the recession, with cautious optimism for the immediate future. For the longer-term, the outlook is brighter, with hopes of a sustained volume of business to the end of the century that could be worth as much as \$1,400 bn.

THE WORLD's aerospace industries will go to this year's aerospace industries will be in the underlying trends — the recession which severely affected a substantial sector of their business—commercial aviation—now appears to be passing. There have been encouraging signs in recent increasing emphasing emphasis on the long-term future, the long-term fut months of both a growth in world air travel, reflected technology across a wide range that if ancillary equipment, in a so far slow, but nevertheless unmistakeable, increase of industrial and scientific support costs for products in new orders for commercial jet transports to revive awareness of and interest in spending resoluteful lines.

At the same time, the steady volume of military aviation and volume or mining with the guided wespons business that sustained many of those industries in the trough of the distinct recession also remains be yeart, while demand in the space sector for satellites and ancillary equipment of all kinds is accelerating rapidly.

There is therefore a new air displays. of confidence in world aero-

By Michael Donne AEROSPACE CORRESPONDENT

in terms of the number of exhibitors and in the size of the static and equipment

Although the number of entirely new aircraft may be small by comparison with this year's Farnborough air small by comparison with Manufacturers' forecasts vary show will be the biggest interprevious years, the significance widely, and are inevitably national air show yet held, both of Farnborough for the world's broadly based, but the most

3154 A/C (\$226bn)

Airbus business outlook 1984-2002

Short-medium range single aisle

3529 A/C (\$89bn)

aerospace matters of all kinds from the countries of the developing world.

The confidence so far being shown is cautious, for the recovery is only a few months old. may even be doubled. But, if all the ventures now In the air transport planned for the future come to fruition—civil, military and in space—the world's overall looking much brighter. Over the aerospace activity seems likely first few months of this year, to expand considerably over the air traffic world-wide was up remaining years of this century. Substantially over the corres-Manufacturers' forecasts vary ponding period last year and

Long range

1149A/C (\$127bn)

Total aircraft

of aerospace (such as the provision of new airports, new fac-tories, and outlays on technological developments) are also taken into account, the figure In the air transport industry, too, analysis of the overall situa-tion shows that the picture is looking much brighter. Over the

ponding period last year and the signs are that in the years ahead, there will be an average annual growth of at least 5 per cent, and possibly approaching 7 per cent. While this is well below the growth rates of 10 per cent or more experienced in the late 1970s, it is still sufficient to ensure that world air traffic will double by the early 1990s, and it is already imposing renewed pressures on airport authorities to create more capacity, or at least to enable better use to be made of available runways and terminals where additional capacity is not possible for either cost, space or environmental reasons-the latter now a particularly severe constraint, especially in the UK, Western Europe and the U.S.

The airlines themselves are also now in a far better position time past is reflected in figures to cope with their problems from Airbus, Boeing and



Artist's impression of how the proposed new European Fighter Aircraft (EFA) may look. Efforts are now being made by the UK, France, West Germany, Italy and Spain to reach agreement on a major multi-billion pounds programme to develop this new combat aircraft for the early 1990s, to replace ageing Jaguar fighters and other types in European air forces

than they were two to three years ago. Managements, long years ago. Managements, long accustomed to profits and growth, learned the hard way how to cope with crisis, losses and cut-backs, and although some airlines have gone out of business, the remainder, through extensive retrenchment programmes, are leaner, tougher and more communitive than they and more competitive than they were. They need to be, for their difficulties are not yet over. Increased competition, and pressures for deregulation elsewhere than in the U.S., here it has been a feature of the past few years, are growing.

Decisions

In the UK alone, a major reconstruction of civil aviation is in progress, with the impend-ing privatisation of British Airways, some reallocation of routes to the independent airlines planned, and major decisions on airports policy awaited (such as development of Stansted or a fifth terminal at Heathrow).
Coupled with the pressures

for more competition on European and long-haul air routes from UK airlines, these measures seem likely in the long term to strengthen the UK airline industry, and will eventually lead to increased orders for new equipment.
That the aircraft manufacturers are also doing better than for some considerable

McDonnell Douglas, all of whom start to move through the pro-so far this year have logged duction phase. substantial increases in sales

Nobody among the manufaccompared with the same period of last year. While some of this improvement is undeniably attributable to the improving seems likely, if only because economic climate among the airlines, it is being led by two other more significant factors.

fleets are ageing and re-equipment decisions that were deferred because of the recession cannot be deferred any longer if the airlines involved wish to remain competitive in the mid- to late-1980s. At the same time, the imminence of new, more stringent government-imposed noise regulations in the U.S. and elsewhere from the end of this year through the 1980s will increasingly oblige the airlines, however reluctantly, to replace their

this improved buying rate among the airlines is reflected in significantly improved production rates among the manufacturers. The improvement is coming none to soon, however, for some airliner manufacturers' production rates have already had to be cut for 1985 because of the paucity of new sees some \$50bn being spent on up to about 5,000 aircraft by the early 1990s, whereas Prott and Whitney of the U.S. sees an eventual market by 1994 of about 4,200 aircraft, worth around \$178bn.

In addition, Pratt and Whitney of the U.S. sees an eventual market by 1994 of about 4,200 aircraft, worth around \$178bn.

turers is expecting an early boom in demand. Rather, a the high cost of new aircraft, and the current high interest rates, are tending to reduce the One is that many existing sizes of such individual orders as are being placed.

Inflow

Nevertheless, although the various manufacturers fore-casts differ in detail, they are all confident that through the rest of this century, the overall demand for new commercial jet airliners will remain high. Airbus, for example, sees a market up to the end of the century of well over 7,000 new aircraft, worth some \$450bn. Boeing sets its forecast lower, It may be some time before about \$172bn for about 3,850 his improved buying rate aircraft up to 1995. Rolls-Royce

because of the paucity of new ney sees a market up to 1994 orders last year and earlier. for some 28,500 general aviation It will probably not be much aircraft of all kinds, worth before 1986 that those rates about \$75bn, covering light aircraft of the rates are seen as a contract of the rate of will rise again, as the orders craft for leisure as well as businow coming on to the books ness and executive aviation. CONTINUED ON PAGE 8

CONTENTS

Manufacturing

Civil airliners: signs of

pick-up in orders Military aircraft: strong demand expected to New materials: wide ranging development continues New techniques: computers lead race for supremacy Helicopters: market sustained by military orders Missiles: attracting everincreasing resources ... Engines: fierce competition for new orders ... Space ventures: Debate over Europe's role ...

Air travel

Airlines: rein on costs as prosperity returns ... 10 Finance: leasing schemes for new fleets 10 Airports: Growth forecasts raised as demand strengthens 11 Business aviation: volume of deliveries cut 11

The world makers

United States	12
Canada	12
Soviet Union	13
The UK	14
France	15
Belgium	15
Netherlands	16
Italy	16
Spain	16
West Germany	17
Sweden	17
Israel	18
Greece	18
Indonesia	18
Brazil	19
Japan	19
Australia	20
India	20
Editorial production: Mich	ael
Strutt and Arthur Dawson	n

I he Jewels in our Crown.

To call the Westland 30 a jewel is no mere flight of fancy. It is quite simply the finest, most versatile helicopter in its class.

It has been highly successful in the UK. It's now making inroads into the notoriously difficult American market.

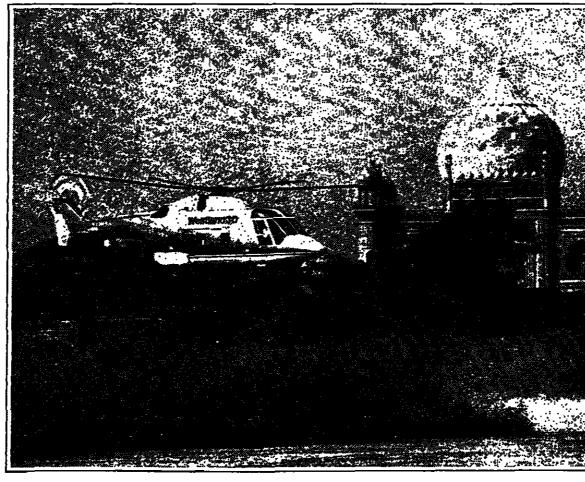
And today, even as you read this, it is the subject of intensive negotiations with the Indian government as well as many other customers throughout the world.

It's another jewel in the Westland crown. But only one of many.

EH101 The world's newest helicopter being developed by Agusta of Italy and Westland of Great Britain backed by both governments with both military and civil versions in its first generation.

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And the kind of hard work that will bring in the glittering prizes of tomorrow.

Westland plc

Yeovil, England

Better times lie ahead as orders pick up

Civil airliners

MICHAEL DONNE OVER RECENT months there

have been encouraging signs that the world's airliner manufacturers may be heading for better times, and that the long climb out of the trough of recession could be under way. Boeing, the world's biggest builder of jetliners, has reported sales in the first six months of this year of 83 aircraft (of which no fewer than 53 have been for its short-tomedium range 737-300 advanced aircraft), compared with only 30

aircraft), compared with only 30 in the first half of 1983.

Both Airbus Industrie in Europe and McDonnell Douglas in the U.S. have also done much better than last year, with new orders flowing in for A-310s and the new A-320 for Airbus, and a steady demand for the MD-80 series for McDonnell Douglas.

One significant indication that

One significant indication that the world airliner manufacturing business is on the verge of an upturn is that sales of secondhand aircraft have increased substantially in recent months, and the big surplus of such aircraft that became a feature of the recession of the being substantially reduced.

There wide-bodied jets feature of the recession is now

Large wide-bodied jets secondhand are difficult to get. Although there are a number of "white-tails"—new unsold wide-bodies — held by such manufacturers as Airbus Industrie and Boeing, the builders do not anticipate too much difficulty in disposing of them as the airlines' own conthem as the airlines' own con-dition improves, generating a

demand for equipment.

The makers have always recognised that the glut of used aircraft would have to diminish substantially before sales of new aircraft began to rise, and the fact that both situations are now emerging indicates that better times may well be on the way, though no one is yet prepared

own yields by the airlines, following their severe retrenchment measures of the past few

Alrline managements are now better equipped to understand and cope with external economic influences, and can react more swiftly. At the same time, fuel prices (one of the biggest single cost items in the airlines' balance sheet) have stabilised, and in some cases have actually declined, and this, coupled with the internal re-trenchment undertaken by many airlines, has also improved their financial situation.

As a result, many airlines are now able to focus more atten-tion on fleet requirements and long-term re-equipment strategy. At the same time, the deadlines for compliance with new government-imposed noise regulations, coupled with the ageing of existing fleets, are obliging managements to think more

managements to think more urgently of fleet procurement. Airbus Industrie believes that between now and 2002 there will be a world market for nearly 8,000 new airliners of all kinds, worth close to \$450bn. Airbus believes that of this market, more than 3,500 of the aircraft required will be in the "single-aisle" category, such as Boeing 737s, McDonnell Douglas MD-80s and Airbus A-320s, worth about \$89bn; about 3,154 aircraft will be in the short-to-medium range twin-aisle catemedium range twin-aisle category, such as Airbus A-300s and Boeing 767s, worth in all about \$226bn; while the rest, about 1,150 aircraft, will be in the long-range category, worth about \$127bn.

Strong

Airbus believes that it can capture about 20 per cent (\$18bn) of the single-aisle business; about 33 per cent (\$75bn) of the short-to-medium range twin-aisle business; and about 17 per cent (\$22bn) of the longrange aircraft business - a collective total for Airbus of



The world's major aerospace manufacturers are looking ahead to a new era as the recession passes.

Total Airbus sales by mid-summer had reached 406 air-craft firmly, for 49 operators, with close to 270 aircraft de-livered. Current production of all versions of the Airbus is running at 44 aircraft a year, but heceuse of the shortage of but because of the shortage of new orders last year, when the recession was at its trough, the production rate is being cut ack to 30 aircraft for 1985 and

If, as Airbus believes, demand

though no one is yet prepared to forecast a boom in sales of new aircraft. The recovery will be gradual, but nonetheless real.

Factors behind this improvement in the manufacturers situation include not only interesting traffic stemming from improving economic conditions, but also tighter control of their solutions.

Collective total for Airbus of about \$115bn.

Airbus is putting particular about to late 1930s, it feels it will have generated enough orders for the believes will eventually be one generated enough orders for the believes will eventually be one generated enough orders for the believes will eventually be one of the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the believes will eventually be one of the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air. To late 1930s, it feels it will have generated enough orders for the world's best-selling air.

A-300 series in various versions, in building an all-new technology aritime for the late 1930s. The late 1930s, it feels it will have generated enough orders for the world's best-selling air.

To late 193

is well aware that both its rivals can still announce new aircraft and, with their great manufacturing strengths and skills, can perhaps catch the A-320 up.

In the meantime, however, availability of the A-320 by 1988 is still regarded by many airlines as a long time off, and Air-bus expects to lose some orders to Boeing and McDonnell Douglas because airlines, for noise and fleet age reasons, cannot wait that long. But it also be-lieves that, sooner or later, many of those same airlines will have to turn back to the A-320 in order to be competitive, especially if the rival makers do not produce their own new

designs.
Alrhus is also now studying Alrbus is also now studying another potential addition to its fleet in the shape of the TA-11, a four-engined, long-range aircraft. The aim is to design an airliner that can fly very long distances, on routes where the traffic available does not justify

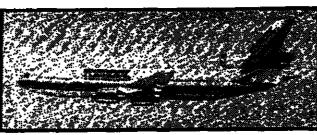
using a bigger aircraft such as a Boeing 747 Jumbo jet.
Airbus believes that the TA-11, powered by the new international V-2500 engine, could offer seat-mile costs equal to or cheaper than those of the Boeing 747. Because of this, the TA-11, says Airbus, is now being positively received by the statement of the nemg positively received by the airlines. Also, the 747 price is now so high—around \$100m per aircraft—that many airlines cannot afford such an aircraft. Airbus says that the TA-11, as now entire god would be able to now envisaged would be able to 1984 to 1995, there will be a fiy more than 5,400 nautical new market for airliners worth miles non-stop (that is, Paris-Rio de Janeiro, or Frankfurt-Tokyo), while an extra \$60bn will be accounted for long-range version could have by replacement of existing age-6,500 nautical miles non-stop range.

As yet, Airbus has not approached governments regarding finance for such a venture, recognising that it must first If, as Airbus believes, demand picks up, the group will be able swiftly to increase production flow by one aircraft a month, giving a total of 46 to 48 aircraft a year in 1955-86.

Airbus is putting particular emphasis on the A-320, which it believes will eventually be one of the world's best-selling airbelieves will eventually be one of the world's best-selling airbelieves that the possibility of profits on the A-320 before seeking further to enlarge the Airbus stable. But by the mid to late 1980s, it feels it will have generated enough orders for the A-320 to prove the success of that venture, to enable it to talk well ahead of the competition seriously to governments on



The Series 300 is Boeing's latest version of the twin-engined 737 short-to-medium haul jet airliner, now Boeing's best-selling jet. The aircraft are seen on the production line at the company's Renton, Scattle, factory.



McDonnell Douglas of the U.S. is trying to woo new airline enstomers for the latest version of its DC 10 long-range tri-jet airliner, called the MD-EXX, which will use improved engines and many other new technological features.

COMMERCIAL AVIATION 1985-1994

Aircraft Market (constant 1985 \$)

U.S.

Units \$ ba

375 19.0 1,100 32.5 1,550

taking a share in it.

Boeing, the arch-rival to Airbus, also believes that, notwithstanding the difficulties of the past few years, the long-term outlook for the airliner manufacturers remains good, although it has scaled down its forecasts a little Roeing stock. forecasts a little. Boeing suggests that, over the period from 1984 to 1995, there will be a by replacement of existing age-ing fleets).

Aircraft

Japanese aerospace industry about \$172bn. (measured in constant 1984 dollars).

seaters; some \$680n by the larger aircraft such as the Boeing 757 and 767, Airbus A300/A-310 and prospective new airliners such as the TA-11. The remaining \$57bn would accounted for by growth, and be accounted for by the largest second will be accounted for types, such as the Boeing 747, by replacement of existing age ing fleets).

If the value of orders already the projected Airbus TA-9.

on hand is also taken into ac-count worldwide, the total value believes the U.S. airline indusof deliveries between now and try alone will account for about 1995 is expected to amount to 42 per cent, while in the rest

2,650 120.0

World

4,200 178.0

of the world, the Far East will have a growing share, of about 17.6 per cent and Europe about

20.6 per cent.

Boeing, while pressing ahead strongly with its own studies into a prospective 150-seater type aircraft in the shape of the "7 Dash 7," is still watching the market before committing itself to any new programme. It is also keeping alive its studies into new versions of the 737, and believes that the latest model, the 737-300, already capable of seating up to about 140 passengers, could be further developed into a 150-seater if

These further improvements could take the form of either a new wing, or new engines (probably the International Asro-Engines V-2500), or both. But the existing 737-800 is still seiling so well—taking some of the A-320's market—that Boeing is reluctant to push into

a new aircraft.

Boeing also believes that it about 165-170 passengers, again using the V-2500 engine. The company believes that there is currently more market interest. in such an aircraft than in any

Major customers

Before Boeing launches either a modified 757, or a "7 Dash 7" or even a new version of the Boeing 757, it would need a spread of two to three major customers, who would be likely between them to need upwards of 100 aircraft over the years ahead. On that sort of base, Boeing believes, a long-term market could be

So far as the V-2500 engine is concerned, Boeing would require a smaller thrust than currently offered (around 22,000 lb), and is discussing that pos-sibility with IAE.

The medium-to-long range twin-engined 767 also continues

are not happy with the bigger, 400-plus seat Jumbo jet.

Boeing believes that it has the potential to give the 162 up to 6,000 nautical miles range, which would make it a highly suitable aircraft for long overwater operations, using either the Pratt and Whitney PW-4000 engine or the General Electric-CF8-80C2.

But one of Bosing's favourite But one of Boeing's favourite programmes at present is a further development of the stretched upper deck? 747 Jumbo jet, the Advanced Series 300 model. By making extensive use of the new, high-strength, lightweight aluminium, lithium, and by refurbishing the interior and using new enginess (either the high-thrust Pratt and Whitney PW-4000 or General Electric CRS-80C2). Boeing believes it can extend the range of the 747-300 by as much as another 747-300 by as much as another 1,000 nautical miles.

This would make it possible could meet prospective 150-plus seater requirements with a possible derivative of the 757, or more than 6,000 nautical with a smaller fuselage to seat miles. The company is discussible to the first term of the miles. The company is discussing this version of the 747 with several airlines, and hopes to announce an order by this autumn.

McDonnell Douglas, the third McDonnell Douglas, the filing of the "big fires" commercial jet airliner manufacturers, is doing well with its MD-80 series of twin-jet aircraft. As of mid-July, it had delivered 167 of these aircraft, and had on the books a backlog of 126 more aircraft firmly ordered, with options or leases for 160.

The company is looking ahead to new markets, and is discussing with airlines the MD-XXX, a developed version of the DC-10 tri-jet, which would have long range and carry about 300 passengers, using the new international V-2500 engine. It would thus fit into a market below the Boeing 747 Jumbo.

In the twin-engined MD-30 series itself, the company is offering various versions, ranging from the 130-seat MD-87 through to the 179-185 seat MD-88. Although it has studied to sell, and there is especially MD-88. Although it has studied strong interest in the longernew 150-seater type designs, the range versions of that aircraft, among airlines who want 200-80 series more than adequately 250 seats and long range but responds to the market chal-CONTINUED ON NEXT PAGE

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TURBINE	ENGL	ves ai	ND SPAI	RE PA	RTS	
Aircraft	τ	S.	Non-	U.S.	War	id
type	Units	\$ bu	Units	-\$ bu -	Units	\$bn
Long range Medshort range	350	4.5	2,460	20.5	2,750	25.6
twin aisle Med-short range	1,000	7.5	1,800	12.0	2,800	19.5
single aisle	2,800	12.0	4,050	14.5	6,850	26.5
Total market	4,150	24.0	8,250	47.9	12,400	71.6
		. <u>.</u>	Source: Pra	et & White	ney Aircraft	
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The British Aerospace Nimrod Airborne Early Warning aircraft Mark 2, now under development, showing the extensive medifications to the nose and tail to house the complex radar systems of this aircraft. The Nimrod, used also by the RAF for maritime reconnaissance and anti-submarine warfare, is derived from the original Comet jet airliner.



The Swiss-built Pilatus PC9 basic trainer recently made its maiden flight at the company's Stans, Lucerne, airfield. The PC3 is one of the four short-listed candidates for selection for the RAF's new basic trainer, to replace ageing Jet Provests. If selected, its manufacture would be substantially undertaken in the UK by British Aerospace.

Especially, the 155-seater trio of the MD-81 (capable of 1,682 over the past few years has natutical miles range), the MD-82 (2,047 nautical miles) worldwide with the F-28 twinand the MD-83 (just over 2,500 engined jet Fellowship, and the

Strong demand expected to continue

Military aircraft

MICHAEL DONNE

THE continued strong demand for military aeroplanes of all types, especially lighter tacti-cal combat aircraft, has bolstered the revenues of many aerospace companies whose civil aircraft activities have suffered severely from the ravages of the recession.

Most of the major military aircraft manufacturers agreealthough their estimates vary
—that this vigorous demand is likely to continue through the rest of the century as more and more countries seek new combat aircraft for their air forces or, especially in the developing countries, build them

British Aerospace is a major builder of military aeroplanes; the Tornado multi-role combat the Tornado muiti-role combat aircraft, the Jaguar jet strike-trainer, the Harrier vertical take-off fighter, the Hawk trainer and light combat aircraft, and the Nimrod maritime reconnaissance and early-warn-ing aircraft developed from Britain's first jet airliner, the

Comet.
Last year BAe's turnover in military aircraft and support services amounted to over £1bn,

for which the bigger Boeing

737s and MD-80s are available.

and Fokker believes a market

for several hundred F-100s is available through the rest of

this century.
In the turbo-prop field, Fok-

ker believes a world demand up to the end of this century of

around 1,000 is likely for the 50-

seat turbo-prop airlines

against £435m from civil air study stage of a new Euro-craft — a clear indication of fighter to replace ageing the way in which military Jaguars in the Royal Air Force activities predominate, at least for the time being.

BAe's current forecast is that between now and the year 2000,

These studies will concentrate

some \$600bn will be spent on some \$600bn will be spent on military aircraft world-wide outside the Soviet bloc and China, about 40 per cent of this being spent in the U.S. The major share of the total market, in terms of cost, will be represented by combat aircraft of all types, of which some 14,000 will be delivered.

The trainer market will account for another 6,500 aircraft, the airborne early-warn-

craft, the airborne early-warning demand for about 200 aircraft, the maritime reconnaissance and anti-submarine warfare roles for about 650, and transport aircraft from the smallest liaison types up to the big freighters, for about 3,000

Pratt and Whitney of the U.S., the world's biggest aeroone world's biggest aeroengine builder, estimates the
military market over the next
decade alone at about \$3200n
(measured in 1985 dollars), an
increase of some 55 per cent
over the previous 10-year
period. Of this total, some 60 per cent will be for the U.S. armed forces and the rest for the remaining free world.

aircraft.

In terms of numbers, Pratt and Whitney sees this as 20,800 aircraft, of which about 210 aircraft, of which about 210 (worth about \$44bn) will be long-range strategic types such as the U.S. Rockwell B-IB supersonic bomber; 9,550 (worth \$184bn) as tactical combat aircraft of all kinds; and about 600 transport aircraft (worth \$36bn).

The remaining 10,440 (worth \$56bn) cover a wide variety of types such as surveillance, reconnaissance, liaison, com-munications, airborne earlywarning airborne command post, evacuation and a host of

or about 35 per cent higher than in the previous 10-year period. The growth in aircraft sales is larger than the growth

on how best to harmonise the various ideas held in the five countries on the type of new fighter required, together with its power-unit and the formula-tion of work and cost-sharing plans. By next March the Defence Ministers will meet again in Rome to take a final decision whether to go ahead with the venture, dubbed the "European Fighter Aismost" "European Fighter Aircreft" of EFA but more commonly

named the Eurofighter. Total of 800

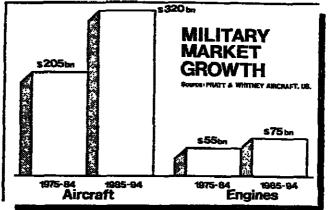
This aircraft is needed by the early 1990s and an eventual total of more than 800 aircraft is envisaged, with exports also expected. Current ideas envisage a multi-role aircraft, with both ground attack and air superiority mission capacity, powered by an entirely new engine to be developed jointly by the partners but probably based on both the French Snecma M-88 concept and the Turbo-Union RB-199 engine that currently powers the Tornado.

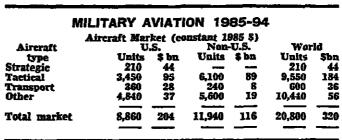
This programme will involve This programme will involve Rolls-Royce, Sneema, Fiat Aviazione of Italy and Motoren und Turbinen Union of West Germany. The airframe will involve British Aerospace, Messerschmitt — Bölkow-Blöhm, Dassault-Bréguet, Aeritalia of Italy and Casa of Spain.
The work-share will probably

be about 25 per cent each for the UK, West Germany and France, with Italy and Spain dividing the rest. Cost sharing will probably be in the same proportions.

There are still many other questions to be settled about the Eurofighter. Apart from the vast market is assessed at 46,000 units, worth about \$75bn, or about 35 per cent bloom. Tornado programme, or by some other organisation specially set up for the task—there is still sales is larger than the grown in engine sales because of the increasingly greater cost of the advanced avionics and weapons systems fitted to modern miliary aircraft.

The problem of determining which country does what in the actual design and development and whether there should be one "design leader" or a committee overland overlording the venture.





	TURBINE EN	GINE	S AND S	PARES	•	
Aircraft	U	S.	Non	U.S.	Wor	ld
type	Units	\$ bn	Units	\$ bn	Units	Şbz
Strategic	1.0 50	· 6		_	1,050	6
Tactical	6.300	26	9,800	24	16,100	50
Transport	3.300	9	1,650	1	4,950	10
Other	11,150	5	12,750	4	23,900	3
Total market	21,800	46	24,260	29	46,000	75
I TOM MAINT			Source: Pra		_	

tries until next March to try to fighter venture is likely to be resolve them.

If they cannot be resolved, the possibility of one or more of the countries breaking away and going ahead alone cannot be dismissed. The French industry especially is still believed to be prepared to go that far if France cannot win overall design leadership of the venture, while the UK aerospace industry appears equally determined to prevent any one nation having

overall control. Meanwhile, both the UK and France will continue to develop their own individual "demon-strators"—the British Aerospace/UK equipment industry Experimental Aircraft Programme and the Dassault-Bréguet/Snecma Avion de Combat Experimental (ACX), both due to fly in 1986.

The cost of the overall Euro-

ing research, design, develop-ment and production, though sales of the aircraft to other countries could produce substantial returns, Another significant factor

behind the Eurofighter is the growing recognition of the need to close the ranks of the European military aircraft manufac-turers to keep the U.S. military

be of the new U.S. tactical com-

years on research, development and initial procurement of an advanced tactical combat aircraft for the mid to late 1990s, a programme in which most of the leading military aircraft companies are competing.

Several other advanced milltary aircraft research programmes are under way in the U.S. These include the Grumman X-29A "forward-swept wing demonstrator," designed to show the benefits of sweeping wings forward instead of back-wards so as to create a new generation of tactical combat aircraft that could be smaller, lighter, less costly and more efficient than existing fighters.

All of the British Aerospace military aircraft programmes are running strongly. All the planned 805 Tornado multi-role combat aircraft have been ordered and so far well over 350 have been delivered. It is possible that a further batch of about 40 Tornado aircraft may be ordered to replace those lost through attrition. major export orders are being actively sought, especially in the Middle East, where Saudi Arabia has expressed interest.

For the Jaguar, a total of 573 have been ordered so far and about 450 have been delivered. Further export orders are being sought and it seems likely that the Jaguar production line will be busy until 1986 at least. Work is also well under way

on the Hawk trainer/light com-bat aircraft for both home and export, while BAc is now de-veloping a new single-seat version of this aircraft to provide a cost-effective type for the many foreign air forces who need a relatively low-cost but efficient tactical combat aircraft. Work is also well advanced on the advanced Harrier GR Mark V for the RAF and the AV-8B Harrier II for the U.S. Marine Corps, in conjunction with McDonnell Douglas of the U.S. A total of over 400 of these Harriers are envisaged for the U.S., the UK, and the

Spanish Navy.
Also looking to the future, aircraft builders out of the next McDonnell Douglas, in collab-generation of European combat oration with British Aerospace, rian the Europeans failed to developing a supersonic vertical agree—and even if they still are and short take-off aircraft, deunable to work together harmoniously over the ensuing months—the likelihood area. has also been studying "plenum chamber burning" (PCB), a bat aircraft moving in to fill the method of boosting the thrust gap in the mid-1990s.

In the U.S. the Air Force is to the high power that superalready planning to spend well sonic V/STOL aircraft would over \$2bn over the next-five need.

in the company's view keep this family of short to medium range jets fully up to the competition. The smaller MD-87 is intended to meet the requirements of smaller regional airlines who do not want a 150-stater, while the MD-88 offers, while the MD-88 offers the restater, while the MD-88 offers the restater and fuel improved noise levels and fuel improved noise levels and fuel offer the replacement of existing ageing turbo-props, and Fokker the replacement of existing ageing turbo-props, and Fokker the new Rolls-Royce ageing turbo-props, and Fokker the new Rolls-Royce ageing turbo-props, and Fokker the new Rolls-Royce ageing turbo-props, and Fokker the most significant development in military aviation in Western Europe so far this year has been the agreement of the UK, France, West Gerband the Air Staffs) of the five countered to the detailed feasibility to the company's view keep this improved noise levels and fuel of the market will be ageing turbo-props, and Fokker the new Rolls-Royce ageing turbo-props, and Fokker the most significant development in military aviation in Western Europe so far this year has been the agreement of the UK, France, West Gerband the Air Staffs) of the five countered to the detailed feasibility to the company and Fokker the new Rolls-Royce ageing turbo-props, and Fokker the most significant development in military aviation in Western Europe so far this year has been the agree the most significant development in military aviation in Western Europe so far the replacement of existing ageing turbo-props, and Fokker the new Rolls-Royce ageing turbo-props, and Fokker the most significant development in military aviation in Western Europe so far the most significant system overlording the venture.

Orders pick up

CONTINUED FROM PREVIOUS PAGE

lenge in this area offered so airlines a larger aircraft that 100 and 50 passengers respectar by the A-320 and Boeing can compete on routes where a tively. The F-100 is aimed at

twin turbo-prop F-27 Friendship airliners, has now launched

Both these aircraft make con-siderable use of advanced tech-

nology, and have substantially improved noise levels and fuel

150-seater would be too small airlines needing a short to medium range jet for routes of lower traffic density than those

One of the World's most experienced aircraft manufacturers.

Short Brothers — leaders in the aviation industry since the turn of the century — are today engaged in wideranging design, production and research programmes covering new-generation aerospace products which will provide pacesetters in their fields through the present decade and beyond.

Backed by the superb modern resources of their 460-acre headquarters complex at Belfast — and with traditions of excellence which have been acknowledged by the world's leading aerospace corporations — Shorts on-going work programme includes:

 Producing the world's first 30-seat wide body regional airliner — the Shorts 330, now adopted by 45 operators worldwide. Producing the advanced, second-generation 36seat 360-best-selling aircraft in its class and already flying with

 Manufacturing the versatile Shorts 330-UTT medium-lift, tactical transport for military users.

19 major regional carriers.

 Building the world's largest light aircraft — the Skyvan STOL transport now flying with over 40 operators.

 Manufacturing and developing the United Kingdom's most successful range of close-range guided missiles —including the combat-proven Blowpipe and Seacat and the advanced Javelin system.

 Providing high-technology jet engine nacelle components for the Boeing 747 and 757 and the BAe 146.

 Manufacturing a range of major, precision components for the 747, the 757, the Fokker F28 and the new Fokker 100.

 Designing and producing some of the largest advanced carbon-fibre components ever to be used on passenger aircraft.

 And — shortly to enter service — the unique. multi-role C-23A Sherpa freighter which is in production for the USAF against orders and options worth some £460m.

the airlines as wide a variety their successors onto the world of types as they could need in the broad 150-seater category. and the F-50 twin turbo-prop. Progressive improvements planned through the 1980s will

nautical miles), collectively in McDonnell Douglas' view offer

Spearhead of advanced materials technology

New Materials MICHAEL DONNE

THE AEROSPACE industry has always been one of the major spearheads for the development of advanced materials tech-

search for higher strength with lower weight and longer component life at reasonable cost has dominated aerospace development for many years across the entire spectrum of civil and military aircraft of civil and minitary arrest.

As a result, the development of aluminium-lithium is regarded as the most significant innovation in aircraft construction materials for many years, in spite of the development of of British Aerospace, pointed out in a recent levium on a recent levium on a recent levium on the sites. out in a recent lecture on sites.
"Future Developments in Tech- Its benefits in aerospace_al-

Exactly where it will lead in an aircraft. is difficult to predict. Certainly it is reducing structure weight for a given duty, and certainly it is changing the types and proportions of materials used. In turn, this poses important questions for the suppliers of

Composite materials In Sir Frederick's view, the rapid developments now occurring in carbon fibre, Kevlar and other materials, and in the pro-duction methods used to obtain the best mixes of such materials, "it seems certain that the proportion of comwill continue to increase.'

At the same time, the aluminium alloy suppliers are also working to provide improved materials, again with the overall objectives of higher strength with lower weight at

One such material that is occupying much time and attention in the aerospace industry is aluminium-lithium, called Al-li in the UK and Alithalite in the U.S. Much ork has been, and is being, done on this material in the UK by British Alcan Aluminium, and in the U.S. by the Aluminium Company of America (Alcoa).

Lithium is the lightest of the metallic elements. It occurs the projected new European widely in nature, although its Fighter Aircraft for the 1990s, concentration in ores is very or even in parts of the A-820 concentration in ores is very or even in parts low. Dry lithium chloride is European Airbus.

monly used in batteries and also has applications in atomic energy. Once alloyed with aluminium, however, and solidified, lithium becomes stable and non-reactive, making it possible to use in a wider range of

The benefits of aluminium despite its initial higher cost over existing aluminium alloys (although this is expected to be reduced in time), it is highly corrosion-resistant, with a sub stantial saving in weight while possessing a much higher degree of strength and stiffness. As a result, the development

"Future Developments in Technology to the Year 2000," the long-standing dominance of aluminium alloys and steel was challenged from the 1950s onwards by the emergence of itanium and composite materials of various kinds.

Today, "we are in the midst of a rapid development of a rapid development of structural materials and methods of manufacture," Sir can be used to give enhanced frange and payload performance range and payload performance

on an aircraft.
One estimate is that if the existing weight of the aluminium used in, say, a jet airliner. is 160,000 lb, the use of aluminium-lithium could reduce it by 14,000 lb, which saving could be traded for either increased payloads (more passengers) or more fuel (giving longer ranges). Aluminium-lithium so

used could cut seat-costs per mile by as much as 6 per cent. One U.S. calculation is that an airline with a fleet of 20 or so long-range transport aircraft using aluminium-lithium structure parts could save as much as \$40m a year on fuel costs of \$2 a gallon. This may be an or at a ganou. This may be an extravagant estimate, since no-one yet really knows precisely what the savings really could or

would be, but it serves to show how seriously aluminium-lithium is being regarded.

In the UK, British Aerospace has been studying the potential uses of the material at Filton, near Bristol, and Warton, Lancashire, undertaking machining, forming and other tests. BAe expects to employ the new material initially in non-

building up, as knowledge of the material's stress - bearing qualities develops, to its use in other more primary structures. This means that aluminium lithium could be used in parts of

stress bearing parts of aircraft,

such as wing-slats and flaps,



Sikorsky Aircraft of the U.S. is now building a new helicopter, making far more extensive use of advanced composite materials than ever before, under the U.S. Army's Advanced Composite Aircraft Programme (ACAP). The helicopter features extensive use of graphite/epoxy and Dupont's Kevlar/epoxy materials, yielding a 24 per cent saving in weight compared with an equivalent

In the U.S., Boeing has also done much work on the new material, and is enthusiastic about its long-term potential. Boeing believes it could be used in new aircraft entering service around 1988, which means that it could be used in any new airliner Boeing might develop to compete with the Airbus At this stage, quantity manufacture of the material is

at a relatively early stage. In the UK, British Alcan, which has made a major contribution to bringing the material from the laboratory to the production stage, is now building a major new production plant at its Kitts Green, Birmingham, factory, which it is hoped to have operational later this year. In the U.S., Alcoa, whose investment in Alithalite now amounts to more than \$50m, says the material will become commercially available in 1985. Alcoa plans to offer it in three basic forms—plate, sheet and forgings—from plants in Cleve-land, Ohio; Davenport, Iowa;

Lafayette, Indiana; and Los tract. Angeles, California. Wi

so as to improve progressively approach to the material, satis-their range-payload perform fying themselves as to its structural and manufacturing integrity, such as its suitability for Programme, a venture designed on the working parts of a gas heing shaped into the complex parts that aircraft require, before committing themselves extensively to its use.

Demand is expected to increase significantly over the next few years, however, so that by the end of this decade it sively in aircraft as titanium is

Meanwhile, the aerospace industry continues to make in-creasing use of other alloys and also of composite materials all kinds. In composites the search for new mixes of materials is unending and large sums are spent on composites

Labour saving In the U.S. Sikorsky has sub-

stantially expanded the use of materials such as graphite, fibre-glass and Kevlar/epoxy composites. Among current activities is the development of a composite-material rear fuselage for the H-60 helicopter, under a U.S. Air Force con-

manufacture of lithium by electrolysis.

As a material with a low-melting point, highly reactive with oxygen, lithium is com
Minusure used in material in the possible use of aluminium in the A-320, perhaps with oxygen, lithium is com
Minusure used in material in material so decreased parts, 73 assembles in deep lithium of fasteners. Using commaking an extensive study of the material promaking an extensive study of the material producers to gauge the production posite material producers to gauge the production of new methods and the use of
fewer steps in the manufacture.

So far, the aerospace builders and 1,700 fasteners.

The constant

The

The company is also responsearch for higher efficiencies sible for the U.S. Army's S-75 and performance throws extra Advanced Composite Aircraft thermal and mechanical stresses to produce the world's first turbine. composite-airframe helicopter. To composite turbine.

aimed at producing and evaluat-ing an airframe that will achieve a 22 per cent saving in weight, several new high-temperature and a cost saving of 17 per cent alloys. Much work has also been over conventional metal air-trames, by making extensive of some engine parts under low frames, by making extensive use of Kevlar, graphite, fibre- stress by replacing alloy comglass and other composites. In fact, the ACAP has bettered

cost saving, as well as sub-stantial improvements in reliability and maintainability. formance.

Also in the U.S., work has
been under way for some time
Royce include the progressive
on the development of an allreplacement of steel compressor venture has been delayed because of difficulties encountered in the certification

programme. It is still intended while for even higher-temperator but the aircraft into quantity ture use, a powder material, production, however, with Astroloy, has been developed. assembly of the aircraft in This is a nickel-based super-Northern Ireland, perhaps start-ing in the New Year. alloy disc material which gives increased strength and tempera-

It will be up to the zerospace struction, such a component is substantially slowed, and most with higher rim manufacturers to work out their highly labour intensive, with of the labour force has been, or offering longer

To counter those effects, and

The ACAP venture has been extend the durability of engine components, Rolls-Royce has initiated the production of ponents with others made from carbon or glass-fibre.

these figures, with a 24 per cent weight saving and a 23 per cent materials is to produce a lighter, stronger engine with scope for stronger engine with scope for the stronger engine with sco

discs and blades with lighter twin turbo-shaft Lear Fan. This titanium alloy components. A venture has been delayed new allow, Titanium Ti 5331S, permits more extensive use in the hotter parts of an engine, meanwhile, activity at the ture resistance, making it
With conventional metal conNorthern Ireland plant has been possible for turbines to run
ruction, such a component is substantially slowed, and most with higher rim speeds and



New technology on the flight deck

The new generation of jet airliners eliber now under develop ment or entering service, such as the Airbus A310 and A-300-600, feature new concepts in flight technology, whereby extensive use is made of "push-button" and cathode-ray tube electronic displays, enabling these aircraft to be flown safely and easily with two-man crews. On the Airbus cockpits (shown above), the cathode ray tubes are used to display intight and navigation information, together with the electronic monitoring of aircraft systems and the presentation of warning information on malfunctions easing the pilots' workload and making the flight deck a more congenial place

material and machining time. Rolls-Royce has also developed a laminate material named Transply which considerably improves on conventional materials used in the very hot parts of a gas turbine, where flame temperatures of about 2,000 degrees Centigrade are common. The materials used in the combustion chambers must therefore be capable of withstanding the extremes of temperature and pressure.

Ceramic coatings Ceramic coatings can help in

this respect, but it is suit necessary to keep the metal temperatures as low as possible. Transply has been found highly beneficial in this respect when used in combustor casings. Transply is a nickel alloy sandwich with "transpiration" passages built into it to allow the free passage of cooling air. Combustion cooling air re-

quirements are consequently halved, making more air available for mixing with the fuel and for emission control, giv-ing a clearner and more dur-able component. With Transply fewer cooling rings are needed, therefore saving in both cost and weight. Rolls-Royce

working extensively on the use

says that these advanced carbon says that these advanced carbon composites are tolerant of temperatures up to 300 degrees Centigrade. They offer weight savings of up to 25 per cent over light alloys, with no loss of integrity. On the RB-211-524 turbo-jet it adds up to a total weight saving of over 370 lb per unit. On a Boeing 747 four-cooling Jumbo, jet this allows engine Jumbo jet this allows seven more passengers to be

Though the use of carbon composites in engines has been confined so far to lightly loaded structures, much valuable experience has been gained from the aspects of weight-saving, mechanical reliability and manufacturing costs.

Programmes are in hand at Rolls-Royce to extend the application of composite materials and to exploit the higher temperature composites now becoming available. British Aerospace has been a

leading exponent of the development of carbon fibres and other composite materials, especially for military aircraft. BAe has been working on com-posites for nearly 20 years, and apart from developing composite material parts for the Jaguar and the Tornado multirole combat aircraft, considerable effort has been, and is

Computers aid design and production methods

New Techniques LYNTON McLAIN

COMPETITIVE pressures and rapid technical advances have combined to accelerate the in-troduction of new design and manufacturing methods by world aerospace companies.

The advances in aerospace design capacity are based on computer systems and increasingly small, rapid and reliable micro-electronic circuits. In manufacturing techniques the main advances have been in the growing use of automated and production systems. often related to the use of new materials such as composites, including carbon fibre. In high-precision manufac-

turing, companies are making greater use of lasers, for drilling and cutting. Where light-weight, high strength and structural integrity are re-quired, as in jet engine parts, new techniques include the

This approach to design is set to become a standard technique in much of the industry.

One of the greatest advances made possible through CAD is the elimination or reduction of the need to design, develop and produce prototype aircraft, missiles, radar systems and air-borne avionics ahead of full production. The British Aerospace Hawk advanced trainer aircraft is a recent example of of an integrated design and an aircraft that did not go manufacturing system. through the prototype design

The first aircraft to fly was the one first designed and the and detailed engineering work same machine that is in quan-tity production for the Royal manufacturing sequence. This

Air Force. avionics, where electronic circuit designs can be tried and tested with computer - aided

now be designed, if the manufacturers and customers choose. on cathode ray tube displays. Detailed mathematical modelling can be used, allowing the designers to amend and alter a range of variables, including different national statutory requirements and different operational and environment condi-

The increases in the computational speeds of microchips have helped designers in aerospace, but much greater speeds are likely to be required before aeronautical engineers are able to design airframes in their entirety.
Computer design techniques

structural integrity are required, as in jet engine parts, new techniques include the growth of single crystal metallic parts and the use of "metallic sandwich" components.

In aerospace design the techniques production, have enabled the company to produce relatively thick wings with (CAD) is at the forefront of computer - based techniques.

This approach to design is set subsonic speeds and improved lift coefficients. Reduced weight and enlarged fuel volumes can

Integrated system

Linked to computer-aided design is computer-aided manufacture (CAM). Rolls-Royce is developing computer aids to help the design and detailed drawing of components as part

This CAD/CAM system ultimately will be capable of pro-cessing information from design will include operations from The same is true of other the production of numerical aerospace projects, especially in tapes for controlling the machine tools to time and cost

estimating. Rolls-Royce uses the TACITUS

analysis of parts will be possible with the introduction by Rolls-Royce of the numerical geometry system (NGS).

turbo-jets, which get three-quarters of their thrust from air by-passing the hot centre of an engine. The design of the fan is crucial and by removing the "snubber," which links each fan blade with the next blade, the efficiency of the fan can be improved, though there is a penalty because the blades be-

come less rigid. wider blades can solve the problem, but they are be heavier. Rolls-Royce solved the problem, but they are blade fabricated as a "sandwich" from titanium sheet with a light titanium honeycomb

These wide blades are 30 per cent fewer than in a conven-tionally produced fan. Specific fuel consumption with engines such as the Rolls-Royce 535-E4 fitted with the hollow honeycomeb blades could be cut by

up to 2½ per cent. The pre-formed titanium panels of each blade are produced by "creep-forming" to the desired aerofoll shape. The inner surfaces are then chemi-cally etched to achieve the required wall section.

A sandwich technique is also used by the company in its "Transply" laminate material for use in engine combustion chambers. Transply is a nickel alloy sandwich with "transpiration passages" to allow cooling air to reach the inner wall of the chamber.

The effect is to halve the requirement for combustion cooling air, leading to greater fuel efficiency.

Advanced techniques to cut costs and further improve efficiency are at the heart of

the hardware itself.

Cossor Electronics, the UK defence equipment company that is part of the U.S. Raytheon group, uses CAD techniques as standard for the design of its radar and other electronic products.

Most aerospace products can Most aerospace products can Most aerospace products are spent on the three-dimensional Most against a spent on the three-dimensional matter and other electronic are spent on the three-dimensional hardened by the beam.

The development of matheral models to cut the time spent on the three-dimensional hardened by the beam.

The development of matheral matter will be now approached if the most successful of these adspent \$350m on VHSIC work

This process is fully auto-mated and is used at Rolls-Royce to give high consistency Rolls-Royce is a world leader in the development of large fan turbo-lets, which was actually system (NGS).

Another to give high consistency and shorter setting up times. The technique therefore has advantages for individual turbo-lets. vantages for individual and 1984.
short product runs. Within this dominant research

The Lockheed Missiles and Space company of the U.S. has developed computer techniques for showing how people can be used more effectively in aerospace activities. In par-ticular, the company has developed ADAM and EVE, the "anthropometric design aid mannikin" and the "ergonomic value estimator."

Human element

These are computerised outlines of a man and a woman and show how people co-ordinate with the assembly of Trident nuclear missiles, The outlines are produced on Lockheed's CADAM, "computer

graphics augmented design and manufacturing "monitors. Of the six fleet ballistic missile versions produced by Lockheed since the 1950s, "Trident II is the first to be designed entirely by CADAM instead of by the drawing board," the company states.

The best feature of CADAM its ability to help the designer to visualise relationships between design ideas and the "human interfaces" they require, says Mr Richard Davids, a senior human factors engineer at Lockheed.

advances in aerospace design entire boxes of electronics in and manufacture have been aircraft or missiles. Maintenance made through improvements in will be simplified and installaelectronic micro-circuits. Detion space reduced, with a signers aim to achieve ever possible cut of 50 per cent in higher speeds and greater computing capacity on still smaller equipment.

About half of the total cost of

many aerospace manufacturing advances in defence work is has been spent on work by the operations.

Including the importance work is has been spent on work by the operations.

the Air Force in the current fiscal year. Electronics account for \$466.2m, or 36 per cent of the total \$1.29bn technology R and D budget estimates for

spending area the work on "very high-speed integrated circuits" accounts for the biggest single allocation in the entire R and D budget.

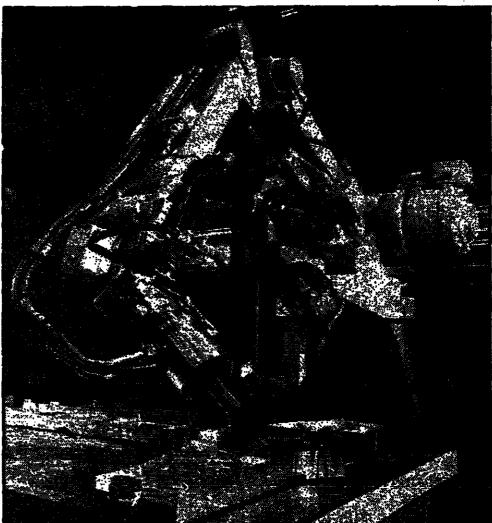
Spending by the U.S. Department of the Air Force on VHSIC is budgeted to reach a peak in the five-year programme this year with \$125.1m allocated. This is almost 10 per cent of the entire R and D budget and over 25 per cent of the Air Force Department budget on elec-

tronics research. Six U.S. contractors are involved in the programme: Honeywell, IBM, Texas Instruments and teams headed by Hughes Aircraft, TRW and Westinghouse. The contractors in Phase I of the programme have already produced. have already produced over 1,500 fully functional VHSIC

chips.
Phase II proposals are under evaluation, with the six existing contractors bidding, along with a new bidder, AT and T Technologies in partnership with Raytheon and E-Systems

Very high speed integrated circuits are expected to change radically the design options open to aerospace companies, especially in airborne elec-tronics or avionics equipment. The potential improvement is illustrated by the possibility of Some of the greatest one card of VHSIC replacing the total life costs of avionic

The importance of these the VHSIC programme so far design on a screen before "turbine aerodynamic cooling Laser beams for welding, spending on "very high speed has been spent on developing 100m money is spent on producing interactive terminal user sys- hard-coating of materials, metal integrated circuits" by the U.S. advanced lithographic and fabris second.



Northrop Corporation of the U.S. has begun operating an articulated-arm robot in the precision removal of sharp edges from aluminium parts for the U.S. Navy's F/A-18 Hornet strike fighter. The machine reduces the man-hours involved in this operation by 40 per cent at Northrop's Machining Cent re in Hawthorne, California

cation techniques.

The result is the production in defence electronics, in radar of memory chips with almost and image sensor equipment, and in equipment for process-area of board. cation techniques. 500,000 transistors, interconof an inch square.

Some of the chips can per-

nected on chips less than a third ing signals from a wide range of

In Britain, British Aerospace system and is expected to begin form at immense speeds. A chip produced by IBM can carry out 100m multiplications every electronic circult boards. A fim

to find specialised applications at Bristol will enable BAe to

The line will include an automated flexible manufacturing production in August 1985. The "multilayer printed circuit second. These speeds are likely investment in a production line for BAe guided weapon boards" are to be used mainly



The Chase Partnership at work with Rolls-Royce at Derby, in front of the new RB211-535E4. Shown from left to right: Christopher Rocker, vice president, Country Corporate Manager, Chase UK; Paul Spencer, Group Treasurer, Rolls-Royce; Michael Kruse, vice president, Aerospace Division Executive, Chase New York; David Wicks, Head of Marketing, Rolls-Royce; John Rose, Head of Sales Financing, Rolls-Royce; Geoffrey Ball, vice president, Export Finance, Chase UK.

Tark to more

Test of time!

្រាក់ ក្រាស្រ្តបា កែកាសការព្រះ

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Slow recovery but long-term demand is good

Helicopters MICHAEL DONNE

OVER THE past two years or so demand for helicopters world-wide has dipped as a result of the sluggishness of commercial needs caused by the economic

Helicopter manufacturers have been sustained by the volume of military business, which has remained at a high level, especially in the U.S. Sikorsky, the world's biggest single manufacturer of helicopters, estimates that during 1983 world-wide helicopter sales amounted to about \$4.5bn. This represented a fall of about 5 per cent over 1982, largely because of poor commercial demand.

Even so, most of the major helicopter manufacturers be-lieve that even if near-term demand is set only for a slow recovery, the long-term demand for helicopters remains good. for helicopters remains good. Both Westland Helicopters of the UK and Sikorsky of the US, agree broadly (although their estimates may vary in detail) that annual demand for helicopters of all types will total about 2,000 aircraft a year in the Western World up to the

Lower figures

Sikorsky is forecasting that between 1984 and 1993 the total world demand for helicopters of all types is likely to amount safer.

light civil sector (for heli-copters up to about 7,000 lb gross weight), which has been hardest hit by the recent the Third World, especially in

light, single-engined civil helicopter market world-wide will attack on overseas military remain depressed as many markets, considerably strength-customers trade-up into the ening its international sales new generation of light twip-staff, and improving its skills

that there will be some compen-sating increase in demand for The sating increase in demand for intermediate and medium-heavy helicopters. This is largely because some major new military helicopter programmes are either now under way or are planned, such as the Anglo-Italian EH-101 Sea King replacement (with also a civil variant)

market. The company has firmly extensive overseas markets for its new Lynx 3, the bigger, national collaboration, and one of its recent developments was a collaborative pact with Constructiones Aeronautcas SA at a cost of several million programme at the company has firmly extensive overseas markets for its new Lynx 3, the bigger, national collaboration, and one of its recent developments was a collaborative pact with Construction of Spain, setting up a pounds, the Lynx 3 has been designed to fill the need for a truly grown of battlefield. ment (with also a civil variant) and the Franco-German PAH-2 anti-tank helicopter, which will enable Casa and Spain to range of roles, including anti-boost the military helicopter form their own Spanish heli-tank and anti-ship attack.



The Westland Lynx 3 is an anti-armour helicopter, capable of close air support, troop carrying and logistics support, as well as casualty evacuation. It is the latest development by Westland of the long-running Lynx multi-role helicopter line

copter design and manufactur-ing base. Initially, Casa will

provide training in the U.S. for

in Australia with sales rights throughout the Far East and South East Asia, in conjunction

This is part of an overall plan by Westland to collaborate with

the Australian aircraft industry, which also includes the possible

trainer to replace its ageing .Jet

Westland is also seeking

with Westland.

Overall plan

Even so, the civil market over the next 15 years or so will continue to be strong, as the figures clearly whow. Much of the growth will be in the cor-porate market, with more and more companies, especially in the U.S., taking to helicopters instead of fixed-wing aircraft as they become more affordable and as recognition of their versatility increases.

The civil helicopter market is The civil helicopter market is still maturing. Today's generation of helicopters is significantly better than yesterday's, and tomorrow's generation will be still better—more efficient, more comfortable, faster and

of all types is likely to amount safer.

about 21,700, of which military aircraft will account for about 10,200 and the civil market about 11,500, as the accompanying table shows.

These figures are slightly lower than forecasts made by Sikorsky a year ago for the ensuing decade. This reflects a corporate customers, both in the licopters for general business use has been under-estimated, and that renewed economic expansion will generate the corporate profits that lead to increased demand for helicipht civil sector (for helicipht civil sector (for helicipht civil sector of which will be a size of corporate customers, both in the circumstance of corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, both in the U.S. and elsewhere, to buy helicopters for general business used to corporate customers, business of corporate customers, business of corporate customers, but in the U.S. and elsewhere, to buy helicopters for general business are sileptically and that renewed economic expansion will generate the corporate customers.

Sikorsky believes that the market will expand: and Sikorsky is itself making a major engined models.

But Sikorsky also believes in handling the commercial intricacies of the overseas

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exceed 1,000 aircraft, of which it aims to win a substantial share. Lynx 3s cost about £1.8m each, with equipment extra, Westland would need to win orders for between 60 and 70 Lynx 3s in order to break even

on the programme.

Markets where Westland is studying possible Lynx 3 sales include Australia, where there is an emerging need for a new naval helicopter, and Belgium, where a new Army helicopter is needed. In both countries, Westland is offering significant industrial offsets in a bid to win

In both markets, however, Sikorsky of the U.S. is offering considerable competition, while for the longer-term future the forthcoming PAH-2 helicopter from the Franco-German Aero-spatiale-Messerschmitt combine will also be a severe competitor

ing base. Initially, case with produce major components for the Sikorsky S-70 and H-60 helicopters, with final assembly and flight testing of both types being at least in some roles. Other markets under study by Westland include Brazil, Malay-New Zealand, Norway and Pakistan for the naval version of the Lynx 3, and Sweden, Switzerland, Holland and Oman

undertaken in Spain.

The development of additional helicopter marketing in areas of mutual interest is also envisaged and Sikorsky will for the Army version.

Other significant developments in the helicopter manufacturing industry over recent months have included the launching of the full-scale development appropriate of the casa employees.
In the UK, Westland Helicopters, which is building the W-30 helicopter for both civil and military use, believes that it can sell up to 725 aircraft through to the year 2000; 415 of these will be commercial versions and the remainder military. development programme of the joint Anglo-Italian (Westland-Agusta) EH-101 medium-weight multi-purpose helicopter. This aircraft is intended in its military version to replace the Sea King anti-submarine warfare helicopters in the Royal Navy and the SH-3D helicopters in the As part of its overseas sales campaign with the W-30, West-land has offered the Australian Aircraft Consortium a plan for the manufacture of W-80 aircraft

Italian Navy.

A commercial variant is also under development. This is aimed at meeting operators' needs for extensive range (300 miles) and large payloads (up to 30 passengers), not only in offshore oil support but also for such activities as logging, mining and on-shore exploration where the location of support facilities either precludes fixedwing aircraft operations or makes them difficult.

manufacture in the UK of the Australian Wamira II basic fixed-wing trainer if that aircraft is selected by the RAF in its current search for a new The first flight of the EH-101 is set for 1988, with first production deliveries from 1989. The venture is being run by EH Industries, jointly owned by Agusta of Italy and Westland Heliconters.

> Sales of well over 700 EH-101 aircraft are envisaged up to the end of the century. About 500 could be the commercial model and the rest military.
>
> One of the most significant new military helicopter contracts now under study in Western Europe is the provision of a new tactical transport heli-copter to replace the RAF's existing Wessex and Puma

well over £200m, is envisaged.
The RAF has already issued an
Air Staff Target (AST-404) calling for the manufacturers to

respond with proposals. So far, three major manufac-turers have responded—Westland, with a derivative of its W-30; Aerospatiale, with a new w-su; Aeruspatiane, with a new version of its Super Puma helicopter; and Sikorsky, which offers a version of its Black Hawk aircraft now used exten-sively by the U.S. armed forces.

Westland is nonetheless pushing its W-30 hard, with a specific variant, the W.30.404, offered to meet the RAF's needs. It is possible, but not yet settled, that

whichever aircraft is chosen will be required to use the new Rolls-Royce/Turbomeca RTM-322 helicopter engine now under development A number of major new

helicopter development pro-grammes are now under way in the U.S., which may revoluin the U.S., which may revolu-tionise the military helicopter market in the years ahead and have an eventual impact also on civil helicopter design. Sikorsky, for example, has a \$77m con-tract from the National Aero-

Westland estimates that, outside the U.S., the market for
this type of helicopter could
well over £200m, is envisaged.

Lynx multi-role aircraft.

(ABC). It involves two counteravionics, control technology,
rotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integrarotating blades on a single axis, and electronic systems integra-

(ABC). It involves two counterrotating blades on a single axis,
giving the higher speeds tion.

achieved by fixed wing aircraft,
coupled with the manoeuvreability of a helicopter.

Sikorsky also believes that its longer term future depends on securing a stake in the next big tus. Helicopters and Boeing Vertal (part of the Boeing Group, U.S. domestic helicopter procurement programme, the U.S. Army's plan for development of an advanced light attack helicopter—the LHX. This represents the biggest helicopter procurement in history, with an eventual demand for at least 5,000 aircraft.

The leader

As with other major new military aircraft contracts, it is expected that, if a foreign designed aircraft is ultimately selected the UK Ministry of Defence will require substantial if not entire production in the UK.

Sikorsky has already been discussing this possibility with Short Brothers of Belfast, but no firm agreement has yet materialised. Aerospatiale, it selected, may link with West-land because of those two companies' existing long-standing relationship steming from the original Anglo-French belicopter may be ackage that produced the "Advancing Blade Concept"

The Leader

The Leader

The Leader

The Leader

The JVX is a "titting rotor" afteraft, making extensive the making extensive and finance on possible maker all of extensive and extensive and extensive and extensive and extensive and extensive the making extensive the making extensive and extensive and

Guided weapons industry on strong growth track

Missiles LYNTON McLAIN

THE guided weapons industry is set for unprecedented growth as military planners assess the implications of the rapidly rising cost of new fighter aircraft and look increasingly to mis-siles and their advanced electronics to meet defence requirements into the 1990s,

Missiles are already emerg-ing as a major force as plan-ners recognise they can no longer afford the high cost of a range of different and ina range of different and in-creasingly expensive aircraft.

This is happening despite the start of successful multi-nat-ional programmes aimed at sharing the costs of developing the new generation of multi-role aircraft. The Anglo-Ger-man-Italian Tornado combined interceptor, strike and bomber aircraft is the most recent ex-

The Tornado is in full production in the three countries at a purchase price of about £17m each for the interceptor

Yet even before the Tornado has finished its production run, there are doubts about its ability to survive in sufficient numbers over enemy territory to drop its bombs without the

aid of airborne missiles.

This has led to the evalua-tion of stand-off missiles, with the Tornado launching them at a distance from the target.
The Tornado is to be fitted as soon as possible with the British Aerospace ALARM air-launched anti-radiation missile. ALARM is designed to home in on enemy radar and electronic installations. knock them out and allow the aircraft to carry

out its mission. BAe has a £200m fixed-price contract with the Ministry of Defence and ALARM is currently one of the lead programmes at BAe Dynamics grammes at BAC Dynamics group factories, along with the BAe Sea Eagle anti-ship missile. BAe also won recently a f130m fixed-orice contract for the vertical-launch Seawolf missile system from the MoD. The VL Seawolf is to be the anti-missile defence system for the Royal Navy's proposed Type

High costs

Future fighter aircraft are likely to cost at least \$2bn for the initial research and development alone. The R and D costs of the U.S. B-1B strategic bomber are substantially greater. One B-1B bomber costs a record \$562.68m in the fiscal year 1984 procurement esti-mates by the U.S. Air Force. With such high costs few totally new combat aircraft can be expected over the next de-cade and beyond. Only the current proposals for a "European fighter," and the compar-able U.S. programme for a "tactical fighter derivative air-craft," are likely to emerge as the major firm programmes in the near future, for service in the 1990s.

Instead, Western military planners are putting ever-increasing resources into the development of missiles and weapons systems, designed to be launched from aircraft. A total of £2,385m is to be spent in the UK in the current financial year on guided mis-

is over 27 per cent of the total spending by the U.S. Air Force on missiles and aircraft in fiscal year 1984, according to

Congressional statistics. These developments, in the U.S., the UK and Western

Europe, are carried out more and more through multi-national collaboration, which spreads the cost and improves the chances of standardisation of weapons among the Nato

Four main initiatives are used for collaborative missile programmes in Nato. The aim is to increase combat effectiveness; strengthen the military and industrial capability of the Nato. Nato alliance; reduce unneces-sary duplication of programmes and conserve defence resources through greater standardisation and inter-operability of

Under the first the "lamily of weapons" concept, Nato re-quirements are harmonised for individual mission areas. When complementary systems are found to be compatible the Nato partners interested in particular weapons may start shared development pro-

The Memorandum of Understanding (MOU) for Advanced late 1990s.

pany, known as BBG (Boden-seewerk Gerätetechnik/British Aerospace GmbH) to be prims contractor for the development and manufacture of ASRAAM. It is based at Ueberlingen, West Germany, Other Nato countries

the U.S.A.F. of a further 1,700 sidewinder AIM9M missibes at the fourth initiative involves a cost of \$194.8m in instance of the fourth initiative involves a cost of \$194.8m in instance of the fourth initiative involves a cost of \$194.8m in initiative involves a feeting of parchasing of the fourth initiative involves a feeting of parchasing of the feeting of the fourth initiative involves and initiative involves a feeting fourth initiative involves and initi missiles entering service in the



The Sky Flash zir-to-air missile is shown under production at the British Aerospace Dynamics Group's factory at Lestock,

full participants. Under the MOU, the U.S. is

developing and will produce the AMRAAM advanced medium-range air-to-air missile. West Germany and the UK are jointly developing and will produce the ASRAAM advanced short-range air-to-air missile. The memorandum allows the participants to procure, co-assemble, and/or produce the others' missile if required.

The agreement is designed to reduce unnecessary duplication of programems for the development of missiles that the U.S. on the one hand and West Germany and the UK on the other

Under these agreements the U.S. will not have the cost of of short-range air-to-air missile. connaisance and intelligence Similarly, the UK and West avionics and landing systems. Germany will not have the cost Three air-to-ground missile of developing the next generative providered for considered for co tion of medium-range air-to-air

The U.S. Department of the Air Force put the cost of research, development, testing

Germany under a fifty fifty under way between Canada, ioint venture. Italy, the Netherlands, the UK, joint venture. Italy, the No.
The two formed a joint com- and the U.S.

Air-to-Air Missile Systems. British Aerospace was chosen signed by the U.S., UK, West Germany and France in Angust lead contractor in a consortium 1980, was the first to use this concept. France has "special conducting a feasibility study observer" status; the rest are of the advanced medium-ran air to air missile (AMRAAM). The AMRAAM is under development in the U.S.

The other companies are Marconi Space and Defence Systems of the UK and Messer schmitt-Boelkow-Blöhm AEG-Telefunken of West Ger-The second initiative on col-

laboration affecting missile programmes is the Nato National Armament Directors Periodic BAe Dynamics has also foined the Italian Oto Melara agreed four years ago. This aims at harmonising

operational requirements, ex-changing technical information and exploring opportunities for co-operation in tactical fighter aircraft, air-delivered weapons, developing the next generation electronic warfare, tactical re-of short-range air-to-air missile. commassance and intelligence,

Three air-to-ground missiles are being considered for cooperative feasibility study and development. These include the long-range stand-off missile (LRSOM); a short-range antiradiation missile (SRARM) and a low-cost powered dispenser

The third collaborative approach involves the setting up of dual production espacity for the same weapon system.

Dual production of the same weapon system, such as the F-16 fighter aircraft and certain Germany. Other Nato countries
have expressed interest in joining the programme, including
Norway and Canada.

AMB/AM is being developed
by the U.S. with Hughes as the
lead contractor.

Sidewinder

The U.S. does not propose to
develop its own short-range
advanced missile beyond the
current Sidewinder programme,
which involves the purchase by
the U.S.A.F. of a further 1,700
Sidewinder AIM9M missiles at.

The fighter aircraft and certain
missiles, may be through
licence arrangements. With the
"imaging" intra-red Mayerick
guided missile, Italy have been
appointed as the leader of a
Nato consortium to co-produce
the missile in Europe.

The current members of the
consortium are Beginin. Germany, the Nelhendands, Turkey
and Italy. Discussions between
the U.S. and Italy have been
appointed as the leader of a
name of the missile in the co-produce
the missile in Europe.

The current members of the
transporters are designed and the consortium are beginned at the consortium are designed and the current side and the cur

oration on missile programme The group, which comprises
British Aerospace Dynamics,
Aerospatiale of France, and
Messerschmitt Boelkow
Riöhm of West Germany is coordinating development work on a third generation of antitank missiles, known as the Trigat programme.

The Trigat missile is expected to involve a medium-range laser-beam-riding missile to replace the Milan anti-tank missile from the early 1990s. The programme is also likely to involve a longer-range infra-red homing missile to replace the Swingire and Hot anti-tank missiles. Substantial production of this missile is expected. The other major ground-launched missile system now under investigation in the U.S. as well as Europe, is the third generation multiple launch rocket system (MLRS). The first version is well-established with U.S. forces, The second, MLRS II, version is now being developed by Vought of the U.S.

MLRS III is at an early stage of development, with competing consortia from the U.S. and Europe aiming to win full development and production contracts. The two consortia are led by General Dynamics and Hughes respectively.

Team

The General Dynamics team also includes Sperry U.S., the Bracknell Division of BAe Dynamics, Dynamic Nobel of West Germany, SEP of France and Scicon of Britain. The Rughes team includes Aerospatiale of France, MBB of West Germany and the Stevenage Division of BAe Dynamics.

BAE Dynamics 188 also joined the Italian two mercias gun manufacturer in a temp-ing agreement signed in June 1984, to try to win a 2330m contract from the Canadian Federal Government for the

low-level defence of the Canadians two airfields and field acmy in Europe. Bids for the work have to be submitted by the end of this month.

BAe Dynamics has offered the Canadians the Rapler missile ground to air defence system, radars and communica-tions equipment. The agree-ment with Oto Melara enables the two companies to offer a comprehensive system incine-ing OM's four-barrel 25 mm; Sidam gun. Oto Melara is to make arrangements for Discussions prior to MOU make arrangements for negotiations have been under Canadian industrial participafacturing, of Toronto, when Garrett became BAe's Canadian

industrial partner for the dis-

semination of offset work the

YOU NEED GE and evaluation of AMRAAM siles, weapons systems, elec-tronics and instruments for the programme in fiscal year 1984 for weapons systems at \$188.6m. In addition, an (LOCPOD). estimated \$62.9m is budgeted to Discussions prior to MOU TO GET THE ADVANTAGE. Royal Navy, the Army and the Royal Air Force. This figure be spent on procurement of the is over a third—34.5 per cent-of the gross UK defence pro-duction expenditure in 1984-85. missiles this year. ASRAAM is being developed by British Aerospace Dynamics Group, as lead contractor in Britain, and by Bodenseewerk Talks on the short-range of Toronto, when the contractor missile, which could be carried by the Tornado air between BAe and Garrett Manufacturing, of Toronto, when GENERAL (S) ELECTRIC In the U.S. the total missile procurement for the Air Force Britain, and by Bodenseewerk craft Talks on the short-range Gerätetechnik (BGT) of West anti-radiation missile have been

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Cautious optimism about long-term demand

Engines MICHAEL DONNE

THE WORLD'S major aeroengine manufacturers, like the airframe builders, have suf-fered severely through the recession in world airliner markets, but they are hopeful that the signs of improving orders for airliners will be reflected soon in new orders for

Such orders as are available are being fiercely contested, however. The pressures on the aero-engine makers for keen initial prices, accompanied by favourable financing terms, high quality and prompt delivery dates, have become

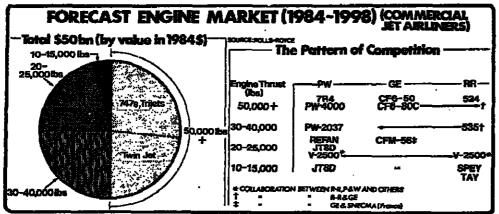
As the engine makers slowly climb out of the trough of the past two or three years they remain optimistic about the long-term high demand for their

remain optimistic about the long-term high demand for their products.

Rolls-Royce, which has conducted a severe retrenchment programme during the recession, laying off a significant number of workers, now believes that the situation is improving. But, like other major engine manufacturers, it remains 170 passengers. manufacturers, it remains cautious about the immediate

For the longer-term Rolls-Royce, like other manufacturers, believes the prospects are good, with an eventual world market for commercial turbomarket for commercial turbo-jets worth \$50bn (in 1984 covering commercial, military dollars) up to about 1998 in and general aviation aircraft, the main categories of engines with the turbine engine market giving more than 10,000 lb accounting for \$169bn of that

The accompanying chart Pratt and Whitney breaks shows how Rolls-Royce sees this this forecast down by suggest-market being divided. In ing that the commercial aircraft addition, in the field below market will account for some 10,000 lb thrust, there is likely \$178bn of sales up to 1994 (not to be a further substantial too far from the Boeing Comvolume of business in turbo-mercial Airplane Company's propeller engines and new estimate of \$172bn including small-thrust jet engines. Rolls-Royce sees the world not delivered), with the mili-



commercial jet airliner market amounting to more than 5,000 aircraft over the next 15 years, of which only 900 have been ordered so far. The motivating force behind this inflow of orders will be an average growth in world air traffic of

170 passengers.
Pratt and Whitney, the world's biggest aero-engine manufacturer, spreads its fore-casts over a wider area. It argues that from 1985 to 1994, the total world market for air-

market will account for some \$178bn of sales up to 1994 (not

aviation \$75bn.

The turbine engine components of these sales are \$71bn for commercial turbine engines (rather higher than the Rolls-Royce forecast) for military en-gines and \$23bn for general aviation engines.

Encouraging

Like other engine and airney sees the potential for sus-tained traffic growth as enouraging," provided the current economic recovery can be maintained. P. and W. expects world air trific growth in 1984 to approach 8.5 per cent, up from 4.7 per cent in 1983, and suggests that growth over the next three years will average more than 7 per cent a year.

It believes that as much as 60 per cent of the forecast sales of aircraft and engines will occur in the second half of the 10 years to 1994, as the econothat annual sales of \$20bn a year could be attained in the early 1990s.

tary market accounting for and that in the first quarter of \$320on of sales and general 1984 alone it received orders for nearly four times as many large commercial jet engines as in the whole of 1983, including engines built by its partner CFM International (in which Snecma of France is also involved on a 50/50 basis).

50/50 basis).

GE says the fastest selling engine is the new GE-Snecma CFM-56-3 which powers the new twin-engined Boeing 737-300. Engines have been ordered this year for more than 74 aircraft, with the total number of CFMwith the total number of CFM-56-powered 737-300s on order now standing at 124.

aircraft, there are now entirely new major engines likely to be required up to the year 2000, and most of the engines, for both civil and military, use likely to be needed have aiready been projected, and are either under develop-ment or soon will be. This does not preclude the continued refinement of exist-

10 years to 1994, as the econo-ing aero-engine programmes, mic recovery strengthens, and however, and indeed a substantial part of the development budgets of the world's major the third of the "big three" improving the noise levels, turers into collaborative ven-aero-engine builders, also says pollutant emission standards tures. The past year has seen that a recovery in commercial and overall fuel consumption some remarkable developments aviation business is under way of a wide range of existing which only a few years ago

may be more derivatives of One of these has been the existing engines, in which a decision by Rolls-Royce and sufficient number of refine. General Electric of the U.S. to ments to any one engine will collaborate in the future justify bringing them together development of engines in two in one big jump forward with

This is already occurring, for example, with the Rolls-Royce RB-211. with its 535 version for such aircraft as the Boeing 757 twin-engined airliner being steadily improved through the steady occurring, for to-high thrusts (more than about 40,000 lb) and on the steady occurring for example, with the Rolls-Royce RB-211-535 for medium-to-high thrusts (more than about 40,000 lb) and on the steady occurring for example, with the Rolls-Royce RB-211-535 for medium-to-high thrusts (more than about 40,000 lb) and on the steady occurring for example, with the Rolls-Royce RB-211 with the Rolls-Royce RB-211-535 for medium-to-high thrusts (more than about 40,000 lb) and on the General Electric CF6-80C2 series in the high-thrust range (over 56,000 lb). as the airlines press for im-provements, especially in fuel consumption.

Comparable refinements are also likely to emerge from the 535's direct competitor, the recently-certificated Pratt and to-high thrust segments of Whitney PW-2037. Rolls Royce market as they may occur. is already offering the 535-H4 GE has no competitor to the as a possible power unit for the projected new tri-jet airliner not yet developed a new engine, design under consideration by or a derivative of the RB-211-McDonnell Douglas.

improved its most powerful version of the RB-211, the

The British company is also technology. It also envisaged making further improvements that GE will eventually build to the engine, to become avail-the RB-211-535E4 and further able early in 1987. These will variants in the U.S., while Rollsprovide 54,000 lb take-off thrust Royce will build the CE6-80C2 compared with the current in the UK.

53,000 lb, as well as at least Another internationally signi-

Another internationally signiscant development has been the formation of Internationally signiscant development has been the formation of International the arly 1990s.

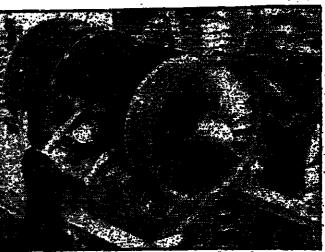
manufacturers over the next 15 number of entirely new designs, to 20 years will be spent on are also forcing the manufacturers the third of the "big three" improving the noise levels, turers into collaborative ventures.

power units, especially those for commercial airlibets. would have been dismissed as impossible, even in the mighty U.S. aero-engine industry. broad fields—on the Rolls-Royce RB-211-535 for medium-

steadily improved through the 37,400 lb thrust C model to the and Rolls-Royce technologies in 40,100 lb E4, with the likelihood these two engines will enhance of other new variants to come their further development and lead to improved derivatives in each case. Over the longer term panies the opportunity of jointly developing new and still better engines to satisfy these mediumto-high thrust segments of the

[cDonnell Douglas. 524, in the 60,000-lb thrust Rolls-Royce has also further range which the CF6-80C2 is designed to achieve. version of the RB-211, the The respective initial 15 per 524D4, producing a further 2 cent shares of each company in per cent improvement in the the other's engine programme

with the total number of CFM- cruise performance of the Boe- will gradually build up to 25 per ing 747 Jumbo jet. This saves about \$300,000 per aircraft a ment and component manufacture, as well as an exchange of the same of the same and component manufacture, as well as an exchange of the same and component manufacture, as well as an exchange of the same and component manufacture, as well as an exchange of the same and component manufacture, as well as an exchange of the same and component manufacture, as well as an exchange of the same and component manufacture, as well as an exchange of the same and component manufacture.



Rolls-Royce's latest civil aero-engine, the private-venture Tay, recently made its first run on the testhed, achieving thrusts in excess of 12,500 lb. The Tay is destined to power both the Folker F-100 twin-engined jet airliner and the U.S. Guifstream IV executive jet, with orders already placed for over \$400m-worth of engines

Kawasaki Heavy Industries and U.S. (Snecma-General Electric)

power the new generation of long distance routes where the 150-seater airliners such as the traffic densities do not justify 150-seater airiliners such as the European Airbrus A-320 as well as further developments of the use of such hig aircraft as as further developments of the Boeing 747 Jumbo jet. The both the existing Boeing 787 TA-11 would have a payload of family and the McDonnell Douglas MD-80 Series, or any new airliners those companies may decide to build.

The HE Companies in the such as the use of such hig aircraft as the use of such hig aircraft as the use of such hig aircraft as an extension of the such as the use of such hig aircraft as as the use of such hig aircraft as the use of such hig aircraft as as the use of such hig aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the Boeing 747 Jumbo jet. The such aircraft as the use of such hig aircraft as the Boeing 747 Jumbo jet. The such aircraft as the such aircraft as the use of such hig aircraft as the use of such high aircraft as the use o

Kawasaki Heavy Industries and U.S. (Spectna-General Electric) Mitsubishi Heavy Industries)
jointly represented by Japanese also being offered as a power Aero-Engines Corporation, with 19.9 per cent. The work shares will very slightly from these figures.

These companies are now developing a new engine, the developing a new engine, the perfected TA-II, intended for V-2500, designed initially to long distance routes where the traffic densities do not justify the use of such hig sircraft as the Boeing 747 Jumbo jet. The TA-11 would have a payload of

The UK Government is supporting the V-2500 with £60m in launching aid for Rolls-Royce, out of that company's £220m share of the venture, but Pratt and Whitney will be investing its own woman. The intention of that the company of th

year.

In yet another collaboration
Rolls-Royce is working with
Turbomeca of France on the
development of the RTM-322. mitially designated as a turbo-shaft helicopter engine. Its core, however, can be used for a wide variety of other power units, including one for small business jets. The cost of this venture is estimated at over £100m.

Collaboration growing

CONTINUED FROM PAGE 1

In the military field demand will also remain consistently high especially for light tactical combat aircraft, it existing air forces re-equip to keep abreast of advancing weapons technology, and others, especially in the developing world, seek to build up their defence forces.

In many cases, the steady high demand for military air craft and guided weapons has rearrant and guided weapons has craft and guided weapons has helped to keep the civilian sides of some aerospace companies time to come.

Nevertheless, as with civil aviation, the long-term outlook for military aircraft remains

British Aerospace's current turbo-propeller airliner, forecast is that between now and the end of the century Collaboration ome \$600bn in current dollars will be spent on military air-craft worldwide (excluding the Soviet Bloc and China). This will cover more than 24,000 airwill cover more than 24,000 air-craft, of which the biggest single category, combat aircraft, will amount to about 14,000, with trainers accounting for some 6,500, and transports about 3,000, the remainder being accounted for by specialist

aircraft, such as maritime recon-naissance, and airborne early warning.
Pratt and Whitney's military forecast is for about 20,800 air-craft, worth some \$320bn in constant 1985 dollars, again with tactical aircraft accounting for the biggest share, some 9,550 aircraft worth about \$184m.

If in addition to these figures, the addition to these figures, the anticipated massive markets for guided missiles of all kinds, and the growing market for spacecraft, are taken into account — each likely to be worth many billions of dollars — it can be seen that world aerospace will continue to be extremely busy.

Probably the most significant

by the European Airbus Industric consortium, and the formation of International Aero-Engines by Rolls-Royce, Pratt & Whitney of the U.S., Motorenand Turbinen Union of West Germany, Fiat Aviazione of Italy and Japanese Aero-Engines to build the new V-2500 engine for the A-320 and any other potential "i50-seaters" that may emerge.

New international collaborative ventures now planned in the commercial aviation field include liaison between Short Brothers of Belfast and Embraer of Brazil to develop a new generation of "commuter" and "regional" airliners for the 1990s and beyond, to replace eventually the existing Embraer Brazilla and the initial exploration of the pos-

support for its 767 airliner programme, is anxious to get more of some aerospace companies support in any new airliner will continue to do so for some venture it may undertake, time to come. market. Fuji Heavy Industries of Japan has already signed a deal with Fokker of the Nether-lands to build tail components for the new Fokker F-50 50-seat

In commercial aero-engines, Rolls-Royce has once again inked with Turbomeca of France to develop the RTM-322, initially as a military helicopter engine for the Anglo-Italian (Westland-Agusta) EH-101 Sea King replacement helicopter and its commercial version, but with probability of the season of the standard of the season potential also for exploitation into jet or turbo-propeller engines for other uses, such as a possible new business aircraft jet engine.

In the regional airliner max-kets, Saab of Sweden is working with Fairchild of the U.S. to build the SF-340 commuter and build the SF-340 commuter and regional airliner; Aerospatiale of France is working with Aeritalia of Italy to develop the ATR-42; and the Indonesian —but there are new so many collaborative ventures, and the authorities are so well under the second of th Habibie, has suggested inter-national collaboration for a new Indonesian-designed 100-seater turbo-propeller airliner.

In the military field, efforts are under way to develop a new European Fighter Aircraft (EFA) programme including the UK, France, West Germany, Italy and Spain, that would involve not only the airframe companies of those countries but also their aero-engine companies on a new power-plant extremely busy.

Probably the most significant aspect of world aerospace since the last Farnborough International Air Show two years ago, and indeed in the past year since the Paris International Air Show in 1983, has been the growth of international collaboration, with not only the introduction of new programmes, but the extension of existing ones and the emergence of plans for new ventures.

New ventures

Among the major new ventures the possibilities of supersonic v/TOL.

(EFA) programme including the UK, France, West Germany. Italy and Spain, that would involve not only the airframe companies of those countries but also their aero-engine companies on a new power-plant. France and West Germany are already working on a new antitank helicopter, the PAH-2; Italy and Brazil are working on the new AMX fighter; while the UK and US, through BAe and McDounell Douglas, are working on the Advanced AV-8B Harrier and closely studying together the possibilities of supersonic v/TOL.

tures have been the launching of the A-320 150-seater Airbus laborative ventures are likely by the European Airbus Indus- on the provision of a new basic

In the military field demand Shorts 360, and other such air- sibilities of collaboration. The

bitter fight not only for mar kets but also for a chance to sustain technological progress. These factors alone are likely to force initially unwilling par ticipants eventually into the relevant collaborative club.

Factors encouraging growth of international laboration are not only the wider spread of the develop-ment cost burden, but also the greater production runs that can be achieved, thereby helping to reduce unit costs. Moreover, some of the former criticisms of collaboration— the higher infrastructure costs stemming from the need for increased international communi-cations and the physical trans-fer of finished components to common final assembly lines— have evaporated as the tech-niques of collaboration have been refined.

provide instantaneous data transfer and voice links, while the availability of large capacity transport aircraft makes the shipment of paris easy. There are still problems—lan-more difference—for evapuals difficulties are so well under-stood, that they no longer pose the seemingly insuperable prob-lems they once might have

Diplomacy Nevertheless, stitching up such collaborative arrangements

still takes much time and patience, and a great deal of skilful diplomacy. This is evidenced in the difficulties experienced to date in reaching agreement between the five nations trying to put together the new Eurofighter. While there is still talk of individual countries "going alone" in the event of a complete collapse of any collaborative venture, the likelihood is that eventually Europe will draw together, if Surope will draw together, if only to prevent the wery large market for such an aircraft falling by default to the powerful U.S. serospace industry, which has plans for a new tactical combat aircraft of its own for the U.S. Air Force.

One final point reste to the One final point needs to be sizessed—that even where there is international collaboration, there are usually two or sometimes even three sentures struggling for shares of the same market Competition in world acrospace is fierce and it is intensifying. There are very than a property of the same market are supported to the same market are supported to the same are supp few markets indeed where any one manufacturer has it all his own way—perhaps firs most significant instance is Boeing with the massive 747 Rembo jet. The rewards for success in any single market civil. military, guided weapons or space, can be substantial but the penalties for failure also



Plessey Systems in Aviation at Farnborough International'84.

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Ariane success confirms European independence

Space ventures LYNTON MCLAIN

August 28 1984

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THE LAUNCHING of the tenth and most powerful Ariane rocket from French Guiana on rocket from French Guiana on August 4, with two heavyweight satellites placed in orbit, gave a boost to Europe's space industry at a time of debate on its future autonomy and ability to undertake industrial and commercial work in space independently of the U.S.

The success came after the U.S. civil and military space independent two satellites into correct orbits and after the U.S. National Aeronautics and Space Administration in Europe.

Space Administration in Europe.

and Space Administration (Nasa) aborted the maiden flight of Discovery, the latest Space Shuttle, last month.

The debate is concentrating on two main and related questions. The answers could shape the European, U.S. and the embryonic Japanese space industries into the next century.

The first question concerns what role, if any, should the European space industry have in the \$\$\$hn plans by the U.S.

The commercial exploitation

what role, if any, should the European space industry have in the \$8bn plans by the U.S. in the \$8bn plans by the U.S.
for the first Manned Space of space by European organisastation, to be in orbit by about tions and companies is already

European Space Agency to the Sacce station project in turn DFS in West Germany, and 15 tons in low earth orbit depends on its answer to the question of how far Europe wants to move towards a space wants to move towards a space industry completely independent

ment of a comprehensive European space industry, fully independent of the U.S. by the year 2000. The programme includes a hypersonic space glider and a manned European launcher to be operational by

The proposals have immense

Station, to be in orbit by about tions and companies is already

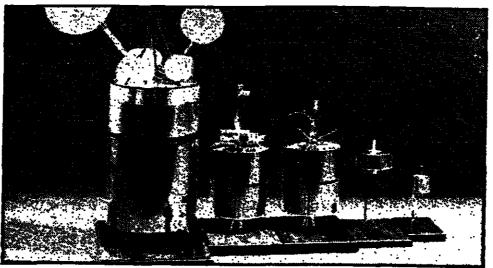
1995.

Europe's answer, expressed through commitments by demarked by the arrival of Governments, industry and the direct broadcasting satellites, satellite remains over a selected not be launched in the people into the factor of the people in the launching rocket.

Europe's answer, expressed through commitments by demarked by the arrival of stationary orbit (where the glider, or "Spaceplane," would consider the people into the people in the people in

Assured

industry is to be in a position to exploit the potential of space for scientific, industrial and commercial work that will remote-sensing satellites. In and service manned stations dustrial and commercial prosential and commercial prosents are expected in meteorological and and payloads in low earth orbit and service manned stations dustrial and commercial prosents are expected in meteorological and and payloads in low earth orbit and service manned stations dustrial and commercial prosents are expected in meteorological and and payloads in low earth orbit and service manned stations.



The remarkable growth in the size of Communications Satellites over the past 20 years is shown in this diagram from Hughes Aircraft of the U.S. (one of the world's biggest manufacturers of satellites), with the tiny Early Bird of 1964 on the right, and the latest giant, the Intelsat VI, on the left

of the next generation of next year, with two target dates in the 1990s for full operation. The same next-generation launcher should also be capable

of the U.S.

The form of debate, the 11-nation European Space Agency and the Europeace group of manufacturers in the space industry, favour much greater European autonomy in space technology.

Eurospace has the more ambitious programme, and says decisions have to be taken by next year if the European industry is to be in a position to exploit the potential of space for scientific, industrial and

commercial work that will remote-sensing satellites.

Eurospace comprises Aeritalia and commercial prospects are likely to open up with the increasing interest in the increasing interest in the increasing interest in space, and Dornier, Laben and ERNO of West Germany.

Messerschmidt-Bölkow-Blöhm space, possibily with unmanned and ERNO of West Germany. The aim is to provide a conditionated approach to Europea to platforms in low orbits.

At the heart of the proposals of the ure point of view of the aerospace industry manufacturers are in the earospace whas produced a the advent of manned and auto-structure, The ESA continues

BURECA or European Retrievable Carrier.

EURECA is a modular space of the European space station. West Germany and Italy have already begun work on Columbus post-1997 and the final design of HERMES should be decided by 1986, to enable the development to be and the development to be obtained by 1997. The major differences between the ESA proposals and the final design of HERMES should be decided by 1996, to enable the development to be obtained by 1997. The major differences between the ESA proposals and the final design of HERMES should be decided by 1998, to enable the development to be obtained by 1997. The major differences between the ESA proposals and the in-orbit infrastructurer, and the in-orbit infrastructurer. The ESA continues

Burecal Retrievable Carrier.

EURECA is a modular space platform designed to work in conjunction with the U.S. Space Shuttle. EURECA would be kept to the fund the U.S. Space Shuttle its modular space platform designed to work in burs, a project to fit in with the fund to provide a concluded by 1997. The major differences between the ESA proposals and the fund to provide a concluded by 1997. The major differences between the ESA proposals and the fund to provide a concluded by 1997. The major differences between the ESA proposals and the fund to provide a concluded by 1997. The major designed to work in the fund to provide a concluded by 1997. The major defe

matic industrial activities in to base its launching plans on the proposed Ariane V rocket Eurospace wants the design of the next generation of sonic glider of the "HERMES" type proposed by Eurospace for lifting four or five people into

> under study (1985-95) and it also believes that more studies are needed before deciding that such a "Spaceplane" is

Co-operation

ESA has based its proposals in-orbit infrastructures (IOI) primarily on co-operation with the U.S. manned space station programme. This would

ESA regards EURECA as a "significant first step towards space industrialisation." It would be used for microgravity

programme" would follow, with instruments and experiments launched and retrieved and a turnround time of about two years starting in 1989. ESA also proposes a Mark-2 version of EURECA, with appli-

cations for remote Earth observations, scientific research and technology demonstrations. Eurospace supports the ESA proposal for the EURECA European Retrievable Carrier and urges support programmes to develop robotics for use with EURECA.

with the U.S. manned space station programme. This would absorb 80 per cent of the budget resources for the IOL.

The rest of the IOI programme would involve technical studies of such problems at re-entry and the start of a European participation in the groupean perticipation in the entry and the start of a European astronauts to perform and the development of European astronauts to perform and the development of European astronauts to perform and the development of European stronauts to perform and the start of a European astronauts to perform and the start of a European astronauts to perform and the start of a European astronauts to perform and the development of European astronauts to perform and the start of a European astronauts to perform and the verification in the space of a long-term European space of laurching men into space.

EURECA or European Retrievable of laurching men into space of laurching men into space. These modules could be development designed to work in conjunction with the U.S. Space platform designed to work in low-Earth orbit, while its payload, primarily of materials bus, a project to fit in with changes to ese the Columbus programme adopted as a European venture, and the start of a European participation in the space station. The total does not include the need to keep Europe in the forefront of space research, to improve alternations in the space race." ESA spayload, primarily of materials to space the Columbus programme adopted as a European venture, and the start of a European venture, and the start of a European participation in the space race." ESA, a material of the period and takes into proposals to spend 946 MAU and a This compares with the ESA.

The to allow the rocket of a long-term European space engine of 30 laurching men into form period in the forefront of should includ

It would enable a pressurised payload module to be launched and docked to the U.S. manned space station in 1992.

Timetable

A resource module should also be developed to the same timetable to provide electrical energy and other services to a free-flying payload module. Eurospace also wants a "service vehicle" to carry cargo and crew between the manned space station and the free-flying pay-

load module by 1996.

The first men for these missions would have to be launched with the U.S. Space Shuttle. Ariane would be used for carrying cargo. But before the end of the century, if Euro-space's other ambitious plans are realised, Europe would have its own launching systems for carrying crews.

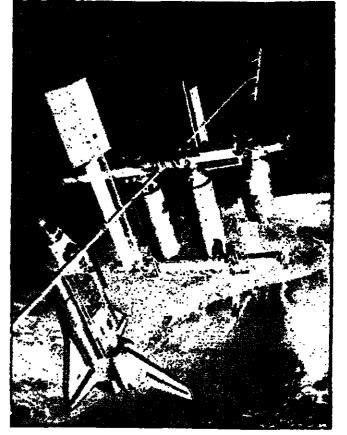
Associated with the growth of satellites is the need for data relays to provide permanent communication between earth and low-orbit stations, platforms and space vehicles, including the transmission of navigational

data. Eurospace wants Europe to disciplines including commercial activities, and could be launched in October 1987 as the EURECA-1 mission.

The EURECA-1 "utilisation be a reasonable degree of autonomy by 1990. It also wants the European Space Agency to increase its budget for scientific research pean Space Agency to increase its budget for scientific research in space, but it leaves the question of scientific satellite programmes to interested scientists.
The manufacturers also sup-

port the ESA programme of earth observation satellites and recommend the development of an observation spacecraft for disarmament control.

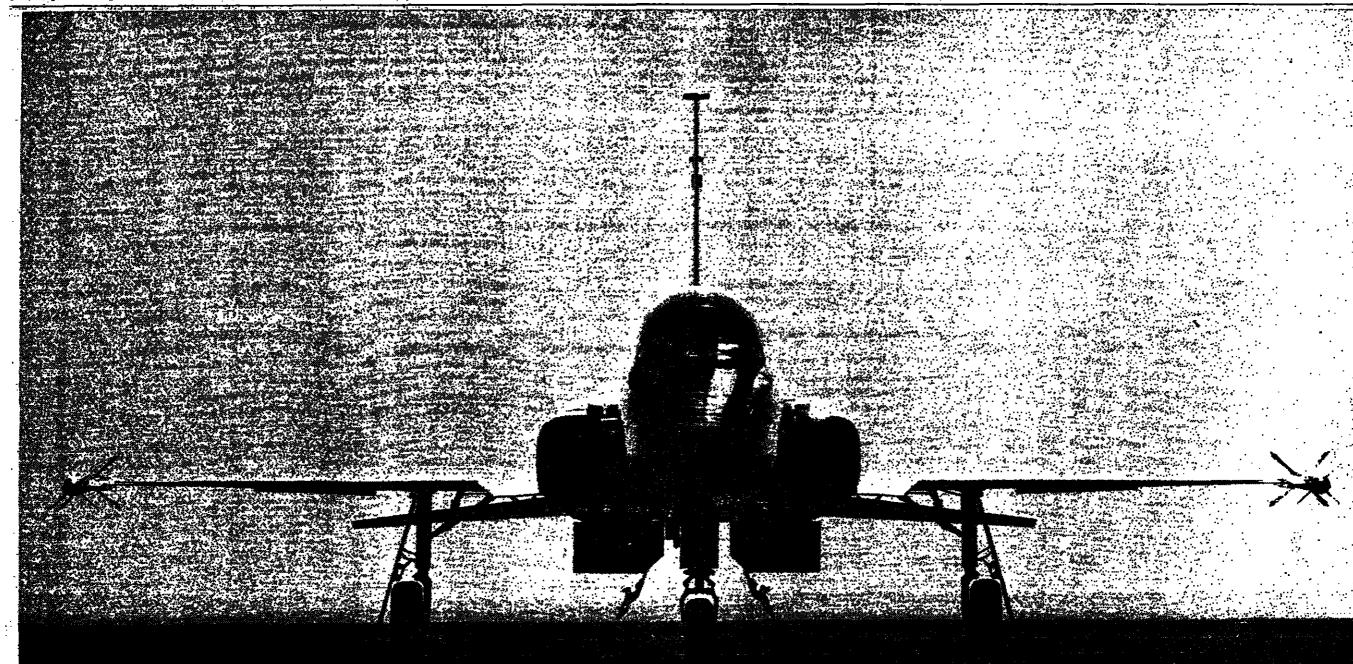
The European proposals would involve the spending of a total of 11,750 MAU (millions of European account units) for the space transport systems alone from 1985 to 2000. This is



depicting the possible structure of the proposed U.S. Manned Earth-Orbiting Space Station, in the early to mid-1990s. Such a Space Station would be serviced from Earth by regular relays of the Space Shuttle Manned Reusable Space Transport System. The Station would serve as a staging point from which Shuttle Vehicles or other spacecraft could move further out into space for a wide variety of missions

for an average investment of means for Europe to reach its 1,500 MAU a year between 1985 objectives more quickly and at and 2000 in terms of 1984 MAU. less cost. These objectives in-This compares with the ESA clude telecommunications and proposals to spend 946 MAU are resigned to 1,500 MAU.

The Eurospace proposals call the U.S. is not ruled out as a financial effort required."



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ical, guaranteed fixed cost known in advance. There ticated fighter aircraft can be both economical and From the ground up.

Air travel again is growing rapidly, bringing with it problems of financing fleet expansion, and imposing new pressures on airports.

Tight rein on costs as prosperity returns

AFTER THE heavy losses incurred by the world sirline industry over recent years as a result of the world recession there are now signs that pros perity may be returning, albeit at present on a modest scale.

Cumulative losses incurred by the world's airlines, as measured by the International Air Transport Association, over the years 1979 to 1983 inclusive are estimated at more than than \$6.15bn. Actual operating losses—that is, money lost on flying aeroplanes on passenger and cargo services—amounted

ind cargo services—
ind cargo services—
to \$1.7bn.

The halance of \$4.45bn represents the amount the industry has had to pay over those years in interest on fleet re-equipment. In some years, such as 1979 and In some years, such as 1979 and for example, the airlines growth of 5.5 per cent worldwide, and a slightly smaller growth of 5 per cent in capacity (the number of seats or volume of cargo space offered). In interest on neet re-equipment. In some years, such as 1979 and 1983, for example, the airlines achieved operating profits, but were plunged into net losses because of their heavy interest payments. payments.

There are now signs that this pattern may be changing. For would be cut to a profit of only 1984, a substantial operating \$75m against the forecast \$250m. profit of \$1.8bu is forecast. If capacity is increased by only which will leave a net profit of one-half of one per cent, then

Airlines

MICHAEL DONNE

about \$250m after interest payments of \$1.55bn, while for 1985, an operating profit of \$1.7bn, and a net profit of \$200m are

The IATA itself is careful to stress that these forecasts are fragile, and that minor changes in the volume of traffic carried and the amount of capacity

But if traffic falls below the forecast by only one-half of one per cent, the financial result would be cut to a profit of only \$75m against the forecast \$250m.

A combination of traffic fall-ng short and capacity being increased too much would result in the industry falling back into the red, with a forecast loss of \$80m in 1984 and a loss of \$120m

in 1985. The argument, therefore, is for the airline industry to con-tinue to keep a tight rein on its costs, and in particular to try to avoid increasing capacity by offering too many seats just because it appears that better times are on the way.

The director-general of the IATA, Mr Knut Hammarskjold, has already warned that there are signs on some routes, such as the north Atlantic, of capacity creeping up, ahead of traffic growth, and that now is the time for the airlines to be even more resolute in restrain-

recession, the industry has been able to survive anly by extensive retrenchment programmes, involving cuts in staffs, routes and aircraft fleets, and the sale of properties and other assets.

Although there have been some dramatic examples of retrenchment schemes — the best being British Airways and Pan American—in fact, nearly every airline in the world has been forced to some extent to follow suit. This has not pre-vented some airlines from falling into bankruptcy, although some that fell by the wayside, such as Braniff of the U.S., have been resuscitated, though in truncated form.

Leaner and tougher

The effect of these measures has been to ensure that the industry worldwide is coming out of the recession leaner, tougher and more conscious of the problems of survival than

One result that is already being seen is the welcome return to profits by some of these airlines—with British Airways again a particularly shining ex-ample—but there are still far too many airlines losing money, and it may be several years be-fore it will be safe to say that the world airline industry is sufficiently uot of its difficul-ties to be able to forecast a more comfortable future.

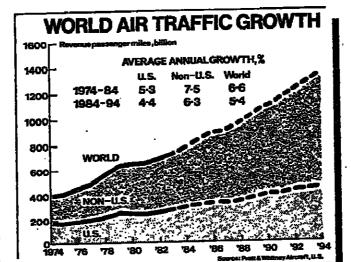
Whether that future will ever be quite as comfortable again for managements as it was in the 1960s and 1970s, when most of the problems were those of of the problems were those or growth, is debatable. Over recent years, some difficulties have arisen which would appear to be-permanent, despite the strenuous efforts being made by the IATA and by individual governments to resolve them.

One is the problem of blocked earnings "—the large ins of cash earned from ticket sales in the developing world which the airlines are not allowed to repatriate by the governments of the countries in

which they are earned.

The IATA says that by this past midsummer, the total amount of blocked earnings outstanding was \$864m, and that had it not been for the IATA's efforts to recover some \$500m of such cash, the figure would have been over \$1.4bn. County of the county of th tries in Africa, the Middle East, South and Central America and the Far East and South-East Asia are all involved.

As Mr Hammarskjold has



REGIONAL AIRLINE MARKET (Unit aircraft deliveries 1985-94) 400 450 U.S. airlines Non-U.S. airlines 750 500 850 850 1,100

One of the fastest growing sectors of world air transport is in the regional and "commuter" airline market, carrying passengers over short distances linking small communities with each other or with bigger "hub" communities. The table shows the likely growth in this area through the 1980s and

they must bear in mind that air transport links are vital to their trade, com-merce and tourism, and help to earn the foreign currencies they so badly need."

among many other governments

Continued efforts are being has been to tighten their grip on

Total Aircraft

made to resolve this situation. but it has to be accepted that the tendency for governments to regard airline earnings as a ready source of interest-free cash is increasing, and no early solution to the problem appears

Other problems facing the world's airlines include the increasing tendencies on the

thising with those countries the industry, rather than loosen suffering from shortage of hard them. While in Western Europe the UK has taken the initiative, the UK has taken the initiative, along with the European Eco-nomic Commission itself, in seeking greater freedom for the airlines to compete on inter-national routes, the tendency

att & Whitney Aircraft, U.S.

air transport. They refuse to relinquish any degree of sovereignty over their

greater competition among air-tions to noise at airports causes lines on international routes, particular concern, although the have been and still are being thwarted, with no early signs of increasing tendencies on the any significant breakthroughs of design and manufacture, and part of many governments to a similar nature to the Anglothat the operators can only tighten regulatory controls over Dutch "open skies" policy ameliorate it by modifying their

IATA TOTAL INTERNATIONAL SCHEDULED SERVICES

ments earlier this summer. similar deal when their own governments. bilateral air agreements with the UK come up for renewal. In principle, however, it seems that major European-wide breakthrough into the era of cheaper

fares is still some way away. This, in turn, is helping to sustain another of the airline industry's major problems— ticket discounting.

It has been estimated that this method of off-loading tickets on to the market throughout the world is costing the industry as a whole more than \$15n annually in lost revenues on the face value of the tickets thus disposed of. The supporters of discounting bucketshop sales outlets, but

bucket-shop sales outlets, but even some airline executives) argue that if those tickets were not sold at the cut-rates, they would not have been sold at all, and the revenue loss would have been much greater.

Moreover, it is claimed that in some parts of the world, especially the Middle East and South-East Asia, ticket discounting has become almost a way of life in air transport, so deeply embedded that it will be almost impossible to eradicate it.

Some airlines which publicly declare their abhorrence of ticket discounting, resort to it

ticket discounting, resort to it behind the scenes. Nevertheless, the airlines at the official IATA level are trying to establish procedures to minimise, if not eradicate, ticket discounting, with what is also and to be seen. with what is claimed to be some degree of success, although, as with blocked earnings, it would appear that discounting will remain a problem for years to

There are many other worries air transport affairs.

As a result, many bids for throughout the world. The cheaper air fares, and for growth of environmental objecairlines themselves argue that noise is the function of aircraft

The airlines argue that it is ones earner this chroughout the for the manufacturers in work The airlines throughout the for the manufacturers in work of Western Europe are much harder, and spend greater rest of Western Europe are much harder, and spend greater watching the progress of the sums, on noise attenuation and Anglo-Dutch experiment, and it reduction, with the active supis possible that some may seek port, moral and financial, of THE PARTY OF THE P

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Quieter aircraft

There is little doubt that the new generation of airliners-the Airbus A-310 and the new A-320 the Boeing 737-300 and the McDonnell Donglas MD-80 series are quister than those of previous generations, and further reductions in noise, though perhaps modest, are on

the way.

Probably the airlines biggest difficulty over the years ahead will be earning sufficient returns on capital to enable them to pay for the new fleets they will

require.
The IATA has estimated that the lata has estimated that its members, more than 130 of the world's major airlines, will have to find about \$105hm, with the world as a whole (including the many non-IATA), airlines, requiring some \$150bm fo finrequiring some \$150m to finance new fleet investment through to the easly 1990s.

The numbers of aircraft involved vary, but it is generally believed that the IATA airlines alone will require some 2,600 airlines of varying sizes (about 1,100 as replacements for existing ageing or full-inefficient fleets and about 1,500 to meet traffic growth) up to about 1993.

traffic growth) up to about 1993.
Paying for these aircraft will pose a major problem. If has been estimated that to finance this re-equipment programme, the airlines will need an oper-sting profit representing a re-turn of about 7.5 per cent on revenues, whereas at present, the operating profit represents only about 2.6 per cent of re-venues, with a forecast of 4.5 per cent for 1984 and 3.9 per cent for 1985. The industry is thus not yet in a position to

This is already giving rise to a plethora of new methods of airliner financing, with new forms of leasing being devised to ensure that not only can the airlines acquire new environ-mentally acceptable and efficient equipment, but that the manu-facturers also can achieve some returns on their own invest-ments in new designs of engines and alrirames.

In all, as Mr Hammarskjold himself has said: "While there

are still doubts and uncertainties on some major issues, the final message is that there are grounds, for Jooking to the future with increased coup, fidence in an overall improvement in the airline industry's

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Leasing schemes meet high costs

Finance

WITH the estimates for future fleet acquisitions by the world air transport industry over the next decade varying upwards from \$172bn to replace both ageing fleets and keep abreast of anticipated traffic growth, it is clear that the airlines face a major problem—fluding the money.

Although the airlines are now alowly climbing out of now slowly climbing out of the severe difficulties imposed upon them by the recession of the past two to three years,

few of them are as yet earn-ing significant profits.

Even where they do so on direct operating account, the net result is still a loss after existing interest payments on fleets aften acquired several fleets often acquired several years ago are met.

years ago are met.

The International Air
Transport Association has
estimated that this year the
financial result for the industry will be an operating profit
of about \$1.8bn, but after
interest of \$1.55bn has been
met the overall result will be
a net profit of only \$250m.

This interest burden—

This interest burden— which covers only the pay-ments by the IATA's member airlines and does not take into account interest payments by the non-IATA airlines world-wide—has been climbing, from about \$550m in 1978 to reach \$1.30m in 1981, \$1.50m in 1982 and the same in 1982.

For 1984 it is estimated at \$1.55bm, and for 1985 about \$1.5bm. This indicates that at world's major lenders—banks, insurance companies and other institutions—aiready have something in excess of \$15bn at stake in the airline

This figure is bound to rise as the airlines, their interest in fleet re-equipment rekindled both by the promise of a return to traffic growth and the imminence of Government-imposed noise limitation regulations that will render obsolete many of their present aircraft, are obliged to return to jet buying.

The manufacturers figures for the first half of this year

show that it is already happen-ing, with the inflow of new orders considerably higher than in the same period of

airlines have little or no eash to spare for new equip ment is not dampening their interest. Because of their own long-term confidence in world air transport growth, the major lenders are turning to all kinds of innovative financing techniques to accom-modate their potential

In many instances, especi In many instances, especially in the U.S., this is only sound business sense. Much of their money has also already been invested in the manufacture of new types of jet airliners, so that to help to finance their procurement also assists in easuring the stability of that investment. More significantly, however, their confidence is based on

their confidence is based on the conviction, backed by all the forecasts, that aviation is essentially a growth industry that will survive and flourish in the long-term despite the difficulties of the recent past. Although the new techniques of lending may vary in detail, they are almost all hased fundamentally in one way or another on the leasing principle. The lenders themselves acquire title to the aircraft and pay for them. They then lease them to the airlines, for various periods

airlines, for various periods and in various ways, in return for annual payments by the Few airlines, indeed, now pay hard each for their air-eraft. Saudia of Saudi Arabia has probably been the only

major example and even that airline has recently resorted to bartering oil for Boeing 747 Jumbo jets in a 10-aircraft, \$1bn deal.

Offset deals

Barter itself—the exchange of commedities of various kinds in return for aircraft— is not unknown in the airline industry but has not been mmonly used for commercial aircraft purchases.

In the form of "affset" it is an increasingly common form of covering the procurement of military aircraftthe client country requiring some form of compensation coften in the form of joint manufacture) in return for placing the order for a specific type of alreraft.

In the commercial aircraft field it is also becoming common for the manufacturers themselves to become deeply involved in raising finance for the airlines to buy their products. Many aircraft makers have established their

own finance companies speci-fically to undertake this kind of work; and these in turn have established close rela-tions with banks and other in-stitutions capable of finding the each needed for the sales.

A major jet airliner deal may thus include not only the manufacturers (of both air-craft and engines) but also banks and other lenders, goveruments and other institu-tions providing guarantees, such as the UK's own Export Credits Guarantee Depart-

Moreover, it is common to find large consortia of banks combining in a single deal. combining in a single deal.

No single hank is prepared to risk its position by lending a particular airline all the money it needs for re-equipment. By spreading the barden among a large number of different financing institutions however not only is the tions, however, not only is the risk to each reduced but it becomes easier to put to-gether the immense sums re-

In such arrangements one bank becomes the "lead" organisation, putting together the consortium which provides the cash. Such groups can often include up to a dozen or more institutions all investing in the same deal investing in the same deal. Moreover, as these groups have spread over recent years, it is not uncommon to years, it is not uncommon to find any one bank with in-vestments spread throughout the world airline industry through membership of several separate consortia.

In this way the banking community has demonstrated its fexibility in meeting what in the past have been particularly heavy demands for new airliners.

The demands that seem likely to be put on the bank-ing community could well be-come much more severe. If the Manufacturers' forecasts are correct—and there is no on to doubt the \$172bn or more that will have to be found over the next decade will require a much. larger amout of cash to be put at risk in the air transport industry than ever he-fore.

The big questions are whether the banking and financial community as a whole will be prepared to accept this increase in the commitment to civil aviation and whether it will resident and whether it will need to be even more innovative than hitherto in solving the air transport industry's own

interest payments.

This is where the problem has to be laid back at the airlines' own door. If they wish to acquire the new fleets they need to meet the replacement of ageing aircraft and to accor growth, they will have to become much more efficient. They will also have to strive much harder to maximise

their profits.

While many sirlines have certainly undertaken severe ageing and uneconomic air-eraft, and as a result returning to profitability, it is clear that much more

Costs too high

There are still far too many strlines, now flying approfitably, who could regain their financial health by more severe labour and asset retrenchment schemes. costs in mainy atribues are too high and yields are inadequate. Some indulge in unnecessary expansion, when consolidation should be the

keynote.
Some buy unsuitable types
of aircraft and do not use
them correctly. Correcting
these deficiencies will remain

managements us to 1990.

It seems likely that in the years ahead the major lenders will take an even more active interest in helpful financing arrangements that they have in the past. They would be sensible to do so, for the air transport industry's dependence upon them is bound to increase, rather than diminish.

But what matters more fixe stything else is a retarn to a stable, long-term expan-

te a stable, long-term expansion of world air traffic. A period of healthy growth in passenger and cargo traffic, if sustained through the remaining 1980s and beyond, will revolutionise the industry and do wonders for its financial health.

financial health.

As some airlines have already demonstrated — and British Airways is a case in point — the swing back to profitability from a period of near-disastrous losses can be achieved quickly if the correct retrenchment measures, stimulated by an incorping economic climatic.



tor at UK airports," the report

says.

These patterns of continued

growth, whatever the final out-come, have already led to a conflict between environmental interests and airport operators

and airlines in the form of the Government-imposed limit on aircraft movements at Heath-

row, London, the world's busiest international airport.

The Government imposed a limit of 275,000 movements at

The limit is set to come into force when Terminal 4 opens

late next year. The limit is likely to be exceeded before

then, however, with a level 276,000 ATMs at Heathrow bet-

ween November last year and October this year.

off "slots" is expected to con-

a year,
The Department has con-sidered three main approaches

to the problem of curbing this demand at Heathrow. These

are: price mechanisms; the

exclusion or restriction of certain categories of traffic or services; and the division of

the limit into quotas for inter-national and domestic services.

At the same time the Depart-

ment wants the "preservation of overall environmental stan-

dards." All the elements of an

all-to-familiar conflict between

continued public demand for air transport and the need to pro-

tect the environment from an unrestricted increase in aircraft

movements are present in the

The final arbiter has to be the

Government, already enmeshed

in a debate over the future ownership of British Airports Authority airports, including Heathrow, and the progress of civil aviation in the UK.

Heathrow debate.

Demand for landing and take-

Growth forecasts raised

Airports LYNTON McLAIN

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THE RETURN to growth of civil aviation last year and the introduction in Europe of several new cheap fare services in recent months, with more to come, have again underlined the strength of demand for air transport and therefore airports.

In the UK alone, passenger movements at all airports are expected to more than double by 1995 conspared with 1982, in the high case, and to increase by 60 per cent in the low case. By the year 2000, passenger movements are forecast to increase by between 80 per cent and 300 per cent of the 1982

The latest air traffic forecasts for the UK, prepared by the Department of Transport in July, showed that in Continental Europe and many developing countries "recovery is expected to be weaker and hesitant by past standards."

But since the previous fore-cast report, published by the Trade Department in May 1983, the projections for the growth of UK gross demestic product have been revised upwards, the latest report said.

This reflected the strength of the cyclical recovery now occurring in the UK, which has been accompanied by a declining inflation rate and improved productivity. "This should provide a hasis for sustained growth of output [in the UK] over the forecast period," the

Revised

There has also been an upward revision of projected growth among the Organisation for Economic Co-operation and Development countries outside Europe.

Further growth is forecast to ntinue into the late 1980s and 1990s, although more slowly, vices, and capacity is likely to remain high for some time to

of growth in gross domestic of London, was a case in point. penetration of the UK leisure product and high burden of The inquiry also looked at market, the report says. debt to the developed world counter-proposals to build a Foreign leisure travellers, have already combined to limit fifth passenger terminal at however are projected to investment in new projects.

Airports in the developing world and in oil-rich countries have often been prestige projects, where grandiose plans have been executed to provide almost capacity well in excess of the immediate demands. Even the oil-rich nations have

seen seen their revenues curseen seen deer revenues car-tailed by sluggish demand for oil; and with existing airport capacity in these countries, especially in the Middle East, more than ample to meet fore-seeable demand, "greenfield" airport projects are unlikely in the near future.

Instead, the expenditure still taking place at airports around the world is concentrated on improvements aimed at making the existing terminal buildings and other facilities more attractive to passengers and more efficient for airlines.

New or upgraded terminal buildings are typical of this investment. But in small countries with modest facilities improvements can be limited to updating or replacing pas-senger and baggage handling equipment, with improvements to air traffic control and especially radar often an essential requirement.

Other ways whereby authorities can increase the effective-ness of their airports without major expenditure on green-field sites include modest spending on new terminal buildings, or even increasing the length of runways. These, enable the authorities to meet and also to provide for larger, more efficient aircraft such as the Boeing 747, with longer ranges enabling more desti-nations, farther afield to be served.

At the same time this solution to the problem of handling the growth in traffic provides the airport authority with a potentially cost-effective way of making more efficient use of its own investment in the airport. Another influence on the de-velopment of airports, however, has been the growth of environ-At the same time, however, UK the recent long-running A slower growth airport authorities around the public inquiry into the British traffic at UK airport

of growth in gross domestic of London, was a case in point. Penetration of the UK lensure product and high burden of The inquiry also looked at market, the report says. debt to the developed world counter-proposals to build a Foreign leisure travellers, have already combined to limit arth passenger terminal at however are projected to the founds available for capital Heathrow Airport, even before increase quickly after 1990, the fourth terminal at Heathrow is expected to be ready for opening later next year.

No decisions have yet been reached. The Government has not published the inquiry report, and may not do so until late this year or early next. Yet the conflicts between environment has provided in the conflicts between environment has also because the UK is assumed to become cheaper than other holiday areas as sterling's effective exchange rate declines.

"The net result in this forecast is to make foreign leaves. the conflicts between environ-mental interests and demand for air travel continue continue travel continue travel. The net result in this fore-cast is to make foreign leisure flights the fastest-growing sec-tor at UK airports," the report

ımabated. This is well illustrated by the latest Air Transport Forecast for the UK, published by the Department of Transport. The forecast annual growth rates for airline travel to and from the UK remain strong, but they are below earlier historic levels and are set to decline over the years

The DoT gives both "low" limit of 275,000 movements at forecasts and "high" forecasts. From the base year of 1982, to allow Terminal 4 to go ahead. when 58.8m passenger move This was "in order to minimise ments were recorded at UK the noise muisance," the Departairports, traffic is forecast to ment of Transport said. rise to somewhere between 80.1m (the "low" forecast) and 100.8m (the high " forecast) in 1990; to between 93.7m and 133.6m by 1995; and to between 105.8m and 172.8m in 2000. These figures represent an average annual growth of between 3.3 per cent and 6.2 per cent over the 18 years from 1982 the base year for the fore-

International traffic generally is projected to remain the domi-nant component of UK passenger movements throughout the forecast period. It is forecast to rise from 75 per cent of total traffic at UK airports in 1982 to 79 per cent of total traffic by 1995.

International leisure traffic is predicted to grow slightly faster than international business traffic in the first phase of the forecasts between 1982 and 1990 but more slowly thereafter. Forecasts of business traffic

after 1990 are uncertain because it is "impossible to assess what effect the rapid development of telecommunications may have on certain types

A slower growth of leisure traffic at UK airports after 1990 world do not have many sub. Airports Authority's plan to is forecast. This reflects mainly stantial plans for brand new, build the third London airport the reduced growth projected "greenfield" capacity. This is at the existing under-used air- for leisure flights from the UK, particularly so in the develop- por at Stansted, Essex, in rich which in turn mirrors the deing world, where modest rates farming countryside north east clining potential for further



executive aircraft is the U.S. Beecheraft Starship One, now under development. An 85 per cent scale model is already flying in the U.S. to prove the validity of the design

Aircraft	reraft Mar U	LS.	Non		Wor	ld
TABC.	Units	\$ bm	Units	\$ bn	Units	Sbn
Feeder-commuter						446
fixed wing Business-utility	1,100	5.5	1,790	8.5	2,800	14.0
fixed wing	10.000	33.0	4.700	12.5	14,700	45.5
Helicopters	5,000	7.0	6,000	8.5	11,000	15.5
Total market	16,190	45.0	12,400	29,5	28,500	75.6
	URBINE	ENGIN	E MAR	KET	_ _	
Aircraft	U	.s.	Non	U.S.	Wor	
Aircraft type				-	Wor Units	1d \$bs
Aircraft type Feeder-commuter fixed wing	U	.s.	Non	U.S.		
Aircraft type Feeder-commuter fixed wing Business-utility	Units 2,500	.S. \$ b v 1.5	Non- Units 4,700	U.S. \$ bn 2.7	Units 7,200	\$bs
Aircraft type Feeder-commuter fixed wing	U Units	.S. \$ bn	Non- Units	U.S. \$ bn	Units	\$bs

Volume of deliveries cut

Business Aviation

LYNTON MCLAIN

THE RECESSION world-wide over the past few years has taken a particularly heavy toll of the business and general compared with the half year aviation market—small, light period in 1983. This was in conaircraft with seating capacities from two up to about eight to 10 passengers.

timue to increase until the early 1990s, when, on present assump-tions about patterns of traffic and aircraft size, it could exceed This has been reflected in considerably lower order books, which, in turn, has substantially the limit by 25,000 movements cut the volume of deliveries by the major manufacturers so far this year.

space, however, the signs are of a revival, although it may be other parts of the industry.

In the U.S., traditionally the main market for general aviafirst half of this year showed that demand is beginning to pick up. The order book billings for the U.S. manufacturers rose by 15.3 per cent to \$740.9m in the six months to the end of in the six months to the end of June, compared with the corresponding period last year, according to the General Aviation Manufacturers Association (CAMA) of the U.S. (GAMA), of the U.S.

Over the same time, however, total deliveries by the makers fell a fifth to 1,087 aircraft com-pared with the first half of 1983 fell a fifth to 1,087 aircraft com-pared with the first half of 1983 this year, and this prediction reflecting the earlier lack of now appears to be coming true.

dollar. U.S. general aviation is the money available for "disexport order books stood at cretionary capital goods pur-\$112.1m at the end of June, a chases," such as business alr-\$112.1m at the end of June, a chases, fall of almost 40 per cent on craft. the period last year.

Deliveries of business jets, however, rose by 23.3 per cent to 74 in the first half this year trast with the decline of over a quarter in the number of turboprops delivered, down to 105 aircraft, and the decline of 17.5 per cent to 184 delivered in the piston engine category in the six months to the end of June compared with the same months

As with other sectors of aeropace, however, the signs are of confident that the business revival, although it may be aviation sector in particular remains a growth area, espe-cially where "on demand" air

transport is required. "Dispersion of commercial and industrial plants and facili-ties; decentralisation of the management function and convenience to resource raw materials add to the rationale of need. Pent-up demand for business aircraft will soon burst into active demand," forecasts the National Business Aircraft

Association (NBAA) of the U.S. Mr John H. Winant, president of NBAA, forecast earlier this year that "a healthy booking of orders for new aircraft"

were the worst affected, down almost 50 per cent to 158 air-craft compared with the period last year, in the face of a strong is total after-tax profit. This sold in non-U.S. markets. is dependent on a "handful of with a total value of \$7bn. A key indicators," says Mr further 6,000 helicopters, valued Winant, but the most important at \$8.5bn, are forecast to be

> "When after-lax profit levels are high, the conditions for reflected in a slow upturn in purchase of a business aircraft deliveries. The expansion of are fertile," he says.

The U.S. has a demand for up to 10,000 business aircraft over the decade to 1994. This level is over twice the number of such aircraft expected to be sold in the rest of the free-world put together, according to Pratt and Whitney, the U.S. manufacturer of aircraft engines, in a survey of likely demand for engines to the mid-1990s.

Helicopters

The Pratt and Whitney survey showed that up to "significant ground 14,700 new business-utility cent per annum. fixed-wing aircraft could be required in the U.S. and the rest of the non-Soviet world between 1985 and 1994, with a total value of \$45.5bn at constant (forecast) 1985 dollar

Up to 10,000 of these businessutility aircraft, valued at \$33bn, are expected to be sold in the U.S., with the remaining 4,700 aircraft valued at \$12.5bn sold elsewhere.

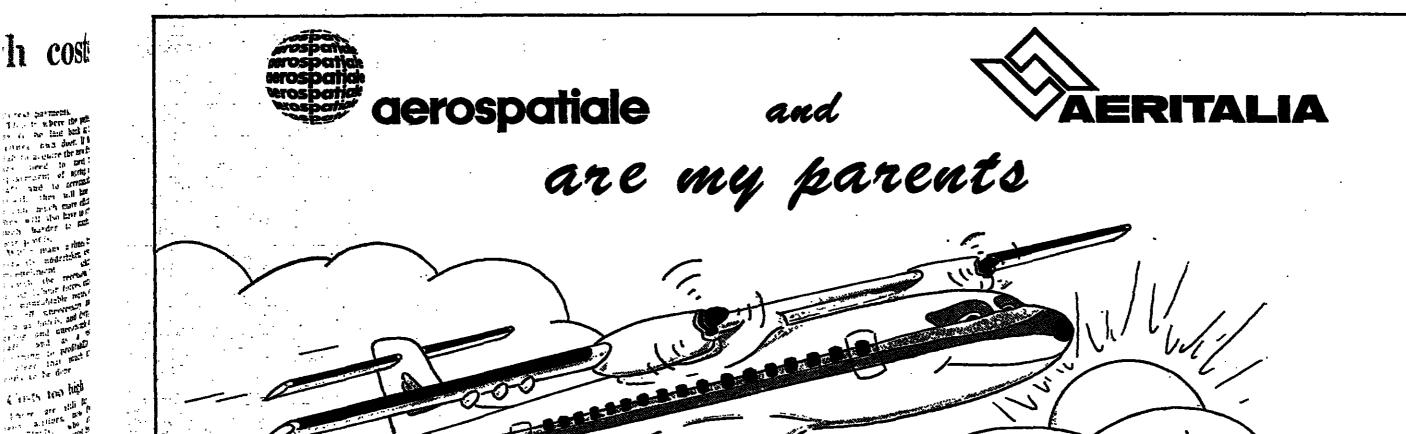
Despite these optimistic

longer-term forecasts, the shortterm situation seems likely to show a modest growth in production in the U.S. industry, deliveries. The expansion of the business aviation sector will be closely linked to the growth of the U.S. economy, and a sustained growth in the latter will have "a significant, positive impact on the demand for general aviation," in Mr. Winant's view. For the longer term, the net addition to the U.S. business aviation flect is expected to average about 7,300 new aircraft of all sizes and types each year between 1984

and 1995. The highest growth rate is forecast to be in the "turbine rotorcraft" fleet (the helicopters), where there would be "significant growth," of 7 per

Smaller growth rates are expected in the turbine-powered aircraft sector, with a forecast annual growth of 5.8 per cent. This growth rate, if achieved, would increase the size of the turbine-powered flect from 9,000 aircraft last year to 18,000 expected in 1995

The sector with the lowest growth rate is forecast to be for active single and multiengine piston aircraft, where the In addition, the U.S. market size of the fleet is expected to is expected to absorb 5,000 increase by 2.4 per cent perhelicopters between 1985 and annum to 1995.



My Name Is The **ATR42**

1 Flew For The First Time On August 16, 1984. 7'll Be The Regional Airlines Best Friend!

Leading companies adapt to fall in civil orders

United States TERRY DODSWORTH

THE U.S. aerospace industry is one of the country's three premier export sectors, sharing with computers and office equipment the distinction of holding 30 per cent or more of the world market in its field.

Until two years ago it also enjoyed a long record of solid growth, with shipments rising from \$21bn in 1979 to \$64.8bn in 1981. But in 1982 deliveries fell 2 per cent to \$63.4bn.

The recession, however, did not hit the agreement sector and the recession of the

not hit the aerospace sector as hard as many other of the country's basic industries. For a start, the growth in military expenditure partly balanced out

At the same time, in a manner typical of U.S. companies, the big aircraft manufacturers have moved swiftly to adapt their strategies to the new conditions. Results thus suffered for a time, but the slump in orders for civil aircraft has not inflicted per-manent long-term damage and

the profits recovery arrived with a bang last year.
One relatively straightforward One relatively straightforward and rapidly instituted line of defence has been a big cost-cutting effort. Jobs have been trimmed back in most of the big companies, often quite radically, and they have also taken the lead in changing the contractual rules in a way that contractual rules in a way that has put the trade union clock

back many years.

Both Boeing and McDonnell
Douglas have taken long strides in the past 12 months to establish the principle that newly-hired workers do not take jobs at the same rate as established

employees.

The unions have fought hard against conceding this point, but they have mainly lost as the companies managed to reintroduce much more progressive, pyramid-type wage systems designed to reward skill and

long service.

Just as importantly for the companies, these systems will also cut costs substantially over the longer term, since new employees will join the work-force at much lower wage rates

A second phase of the cost tions was in cutting non- year

essential expenditure, either by trimming normal capital spendrimming normal capital spend-ing or soft-pedalling research and development. Clearly, these are dangerous strategies long-term but effective over the short run; and in some cases they have followed a detailed reappraisal of where the com-

pany is going.

At Lockheed, for example, a key decision in 1981 was to stop work on the L-1011 TriStar project (taking a heavy write-off into the bargain) and concentrate on military work. McDonnell Douglas decided

late last year to abandon re-search and development work on commercial aircraft because

Talks with airlines

McDonnell Douglas stopped short of saying that it would abandon airliners altogether. the slump eisewhere, allowing But it left a distinct impression shipments last year to lift off once again and jump 15.4 per cent to \$738bn.

abandon airliners altogether. But it left a distinct impression that it might drop out some time in the future, and in recent months it has sought to recent months it has sought to revise its attitude in continued discussions with airlines.
At the same time, however,

threw its resources into the MD-80 jetliner project, which is designed to update the old DC-9. It has since been rewarded with significant sales, including a massive \$1.3bn order for 67 aircraft from American Airlines, one of the largest in U.S. aviation history. In recent weeks, McDonnell Douglas has also begun talking with the airlines again on a possible new derivative of the DC-10 long-range jet, the MD-XXX.

Linked to these decisions to limit the range of commercial models, there has been an in-creasing emphasis on military projects. This may to some extent have been forced upon companies by the slump in com-mercial airlines, but it has been exactly right during a period of steadily increasing defence expenditure.

As Mr Alan Benasuli, an analyst at brokers Drexel Burnham Lambert, puts it, President Reagan's big boost in the military budget is only top- profitability. ping out a cycle of defence spending which began under President Carter after the cut-backs under Presidents Nixon and Ford.

panies score the blg increases in net earnings recorded last



The aerospace giants are being joined by rapidly developing newcomers around the

McDonnell Douglas has added another element to this tactic of moving away from commer-cial airliners by diversifying into other industrial sectors. This year the company has bought Hughes Helicopter and two concerns in the dataprocessing sector — Tymshare, which cost \$308m, and Computer Sharing Services (\$69m).

The group already has its own large data-processing business, to which these two newcomers will be attached

Meanwhile, McDonnell's decision to reduce its current airliner development programme underlines the economic fra-gility of commercial aviation. The U.S. airlines have this year mostly recovered from their cost-cutting war to take advantage of the surge in business travel, higher prices and lower fixed costs, with a return to

Some of the larger carriers have also begun to upgrade their fleets—the American Airlines order at McDonnell Dougnd Ford. las, for instance—but there has Even so, the burgeoning not yet been an enormous rush defence budget has been a big to buy and the U.S. international factor in helping the major com- airlines remain extremely re-

luctant customers.
Indeed, some U.S. interna-

are still in deep financial trouble, as its \$50m second-quarter loss shows.

One problem they have faced in the home market is that many of the new airlines which have appeared to challenge the estab-lished carriers use second-hand aircraft. There are plenty of them around, and in an era of cheap fuel the airlines lack the incentives to search for more economical aircraft.

Sales drop

The sluggishness of the civil airliner market is illustrated in Boeing's first-half figures this year. The world's largest commercial aerospace company saw net profits for the period slip 1.1 per cent to \$180m (although they have been later restated and boosted by changes in tax rulings). Boeing sales fell 21 per cent to \$4.8bu.

The fall was all on the civil aircraft side. Military sales were up, with those to the U.S. Government totalling \$1.95bn, an increase of \$426m on a year earlier. But these gains were offset by lower jet transport

The problems in civil aviation are underlined by the contrast with Lockheed, which hit a difficult financial period a few years ago, and decided to concentrate almost exclusively on military and space work,

Two months ago Lockheed paid its first quarterly dividend since 1969, while in the first half of this year it lifted earnings by 22 per cent to \$146m-only \$34m less than the much larger Boeing.

Most of the other defence-

based companies are also enjoying the benefit of the increase in Government spending although the field is competitive and not without its problems.

Grumman, for example, has Grumman, for example, has shown only slow growth over the past 18 months. In the second quarter of this year it actually experienced a decline in earnings, which fell 4 per cent to \$25m. The company attributed this sluggish formance to heavy research and development expenditure on its X-29 advanced fighter, the A-6 Navy bomber, and

various electronic programmes. Meanwhile, Grumman has received a bread-and-butter Navy contract to improve the existing A-6 and F-14 aircraft for about \$1bn.

Northrop, however, which is

Jumbos to be stretched further

The Boeing 747 Jumbo jet, the world's biggest commercial passenger airliner, continues in production at the company's Everett factory, near Scattle. The latest version is the Series 300 (seen in the foreground) in the colours of Singapore Airlines, which calls it the "Big Top"). Boeing more conventionally describes it as the "Stretched Upper Deck" version of the 747 because the upper cabin has been extended further back along the top of the

fuselage enabling the airliner to seat between 450 and 500 passengers according to interior layout. Boeing's own long-term plans include the possibility of stretching the upper deck still further and perhaps also fitting new wings and engines of greater power to allow an even bigger passenger load, perhaps up to as many as 600-plus in a high-density seating arrangement. The Japan Air Lines Jumbo in the background is a Series 200, without the stretched upper deck.

U.S. A	YEAT	TION	AC'	TIVIT	r FO	RI	ECA:	STS		· : :::-	.: -
,	٠	-		years)			Borres			nnual g	
•			al —— 1983	-r or 1984	ecast— 1985		79-82	32-83	83-84	. 84-85	83-95
Air carrier, domestic:			•			٠. ٠		٠	<u>.</u>		
Rev. passenger emplane-						-	~ ~	6.4			4.6
ments (m)	258.4	272.5	290.3		330.9			0.4	1.1	- 3.8	
Rev. passenger miles (bn)	203.7	207.8	223.5	246.8	255.1		0.7	7.6	7.7	5.9	5.0
Commuter carriers:											
Rev. passenger emplane-				a4 =			11.4	14.0			19.4
ments (m)		17.1			23.4		11.0		8.8		7.4
Rev. passenger miles (bn)	1.5	2,3	2.7	3.1	3.4		15.8	16.2	12.5	10.6	9.3
Fleet size:											· ·
Air earrier	2.237	2.483	2.556	2.657	2,638		3.6	2.9	4.0	(0.9)	2.2
Commuter	1 413	1 494	1.580	1,606	1.682		1.9	0.4	7.1	4.7	4.5
General aviation ('909)	100 0	9129	200		211.0		2.4	(L6)			2.6
	130-0	210.2	200.0	201.0				·/	,,		
Hours flown (m):	44.				6.8		(0.5)	RI	2.4	6.7	2.1
Air carrier	6.4		6.6								4.0
General aviation	42.3	37.8	36.6	37.6	39.1	•	(3.4)	(3.2)	() = 1	4.6 negative	
1979-83, CAB, FAA DATA. FAA A	vistion	Policy	Delice Av	lation Fore	cests FI	sca	1984-95		<u>' </u>		4
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The First.

Igor Sikorsky flew the world's first practical single main rotor helicopter on September 14, 1939. Today, Sikorsky, the company, is the largest helicopter manufacturer on earth.



The Finest.

Sikorsky is now producing the world's finest, most advanced fleet of military and commercial helicopters.

☐ The Sikorsky H-60 series is the new standard of the U.S. Military. As Army BLACK HAWK, Navy SEAHAWK, and Air Force NIGHT HAWK, this next-generation helicopter will serve both present and future multi-role requirements.

☐ Sikorsky's SUPERSTALLION H-53E is the Western World's largest heavy-lift helicopter, now being used by the U.S. Marines and Navy. The MH-53E will be used by the Navy as the nextgeneration airborne minesweeper.

☐ The Sikorsky S-76 MARK II is the finest commercial helicopter in its class for both oil and corporate transportation.

☐ The H-76 military helicopter is a new multi-role aircraft destined for worldwide service.



The Future.

Backed by the strengths of its parent, United Technologies Corporation, Sikorsky is leading the rotary-wing industry into the future. Sikorsky's Advancing Blade Concept (ABC) is the fastest in the world. And its Rotor System Research Aircraft (RSRA) is already testing 21st Century technology.









Sikorsky. The Leader

Company	Sales 12 mths. '83 \$m	% chng. from 1982	. 1983 net earnings \$m	% chng. from 1982	2nd qtr. sales \$m	% chng. from 1983	6 mths. sales \$m	% chag. from 1983	2nd qtr. earnings \$m		6 mths. earnings \$m	
United Technologies	14,679	+ 8	509.2	- 4.6	4,178	+12	8,069	+11	169	+20.7	395.2	+21
Boeing	11,129	+23.18	355	+21.58	2,740	-13	4,830	, -21.3	102	+10.9	180	- 1.1
McDonnell Douglas	8,111	+10.6	274.9	+28.0	2,546	+31.6	4,570	+14.3	77.7	+26.3	145.2	+19.6
General Dynamics	7,146.3	+16.1	286.6	+115.8	1,902.5	+ 7.1	8,762.8	+ 4.5	. 96	+ 32	173.5	+34
Lockheed	6,496.3	+15.6	262.8	+26.7	1,933.7	+21.3	3,716.4	+16.9	78.7	+15.7	146.4	+22.4
Martin Marietta	3,899.3	+10.6	141.3	+54	1,176	+23.3	2,244	+27.8	74.1	+ 20	99	+39,8
Northrop	3,260.6	+31.8	100.7 +	1764.8	838.9	+ 4.3	1,653.8	+ 7.8	38.3	+29.3	69.3	+99.1
Grumman	2,254.8	+ 9.6	110.8	+240	609.9	+11.3	1,199.0	+ 5.8	25.2	- 4	50.5	+ 3.3
										Been	Blades	Nachama

U.S. COMPANIES' EARNINGS

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Feder

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Strong federal funding

Canada

MIACHAEL DONNE

research and development skills.

is showing extremely buoyant results this year. In the first half, earnings nearly doubled

to \$69m as it surged ahead with a big sales increase

helped by improvements in

The company's big gamble is

on its new F-20 Tigershark ist

fighter. Northrop is developing

it out of its own resources,

although it has not attracted a

single order as yet. Work on the project cost \$34.5m in the quarter, almost the same as in

Prudently, Northrop is writing off all this development expenditure against profits; but it clearly needs to maintain strongish earnings to do so and

its results have shown the strain in previous years. In 1982, for instance, it made only

Overall, however, the second-

quarter figures from the U.S.

industry give a broadly positive view for at least the next 12 months. Even if President Reagan were to lose the elec-

tion, few observers believe that

there would be a rapid enough cutback in military spending to

hit the companies for a year or so. On the civil aviation side

orders are expected to pick up because of ageing airliners in

\$5.4m.

the same quarter a year ago.

operating margins.

FOLLOWING the major financial restructuring by the Government earlier this year of the two major Canadian air-frame manufacturers, Canadair and the de Havilland Aircraft Company of Canada, it is now hoped that they will be able to climb out of the difficulties they faced in the early 1980s.

As a result of Federal Government funding totalling some C\$1bn, plus similar amounts of cumulative debt written off, the two companies have been given almost a new lease of life.

The Federal Government believes that both, slimmed down to meet the current realities of the world marketplace, will be stabilised this year and return to profitability in 1985 or soon thereafter, especially if the recession is genuinely fading, leading to a revival of world airliner demand.

As a result of this traumatic exercise, the longer-term forecasts for the Canadian aerospace industry have been small aircraft as the 19-seat revised. The industry's turnover of about CS3bn last year 1,000 have now been sold. is expected to rise to around C\$7bn by about 1987, while employment, which fell from 41,000 in 1982 to about 38,000 last year, is set to rise again, reaching about 50,000 in 1987. Much of the Canadian industry's recovery, of course, will depend upon the scope of the recovery from the recession overseas, where the bulk of long-term demand for the Canadian airframe manufac nities where local airfields tend

airliners and executive trans-

and regional airline market is of significant interest, especially to de Havilland Aircraft; but com- under consideration for Lon- its market image and selfpetition is fierce in the market for small airliners, with the Brazilian Embraer Brasilia, the Swedish-U.S. Saab-Fairchild 340, the Franco-Italian ATR-42 and the UK Shorts 330 and 360, all

More than 100 concerns

fighting for available orders.

Overall, the Canadian indus-try includes not only the two major airframe builders but also Pratt and Whitney Aircraft of Canada, an aero-engine builder which is a major sub-sidiary of the U.S.-based United Technologies Corporation, and well over 100 other companies active across a wide spectrum of aerospace affairs, including, for example, Spar Aerospace and many companies making components of all kinds from avionics to hydraulics, communications systems, simulators, fuel systems, and so on. Of the major manufacturers,

de Havilland, or DHC as it is known, of Downsview, Ontario, has specialised in recent years in short-take-off-and-landing aircraft (STOL) and has had considerable success with such small aircraft as the 19-seat Current emphasis is on the Dash 7 four-engined turbo-prop 50-seat quiet STOL (airliner, which is already in wide service, especially with the smaller commuter-type and regional air-

Demand for this highly efficient airliner continues, and it is establishing a significant reputation as a "good neighbour" aircraft in small commuturers' specialised types of small to be closer to city centres than elsewhere.

In the UK the Dash 7 in the In particular, the commuter fleet of Brymon Airways is in-

vices, both domestic and inter-national. and support

Following the success of the Dash 7, DHC has developed the smaller companion Dash 8, a twin-engined 36- to 39-seater twin-engined 36- to 39-seater quiet short-range transport, which is now in quantity production. To date, five development and certification aircraft are engaged in the extensive flight test programme, with over 1,200 hours of flying achieved.

Det veries to customers are expected to start later this year. The £ 18h 8 will be demonstrated at the forthcoming Farnbornigh International Air Show, where its STOL performance seems likely to arouse ance seems likely to arouse considerable interest.

Earlier this year, the other major airframe builder, Canadair, following substantial losses in 1982 and 1983, also under-went a major financial restructuring with the aid of the Canadian Government. As a result, the "New Canadair" set up under the restructuring plan is relieved of the Old Canadiar's debt burden, and now has a positive net worth.

Canadair reborn

According to the company's last annual report, it is expected that the New Canadair, relieves of the interest costs which formerly burdened operations, will be profitable by 1985, if not before, and any short-term cash before, and any short-term cash requirements for existing programmes and activities will be met through conventional banking arrangements without the need for further Government guarantees.

Canadair is also working on the C-227, a surveillance/ transfer and landing capability. The company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently that it was stated for the company said recently said recen

don's Docklands, close to the confidence, and re-establish its retwork of commuter air serand superior customer service Canadair's major aircraft pro-

grammes currently include pro-duction of the twin-engined duction of the twin-engined Challenger jet executive transport, and the CL-215 twin-engined amphibian, intended primarily for fire-fighting (a "water-bomber") but adaptable to a wide range of other duties.

The company is also engaged on a wide range of sub-contracts. on a wide range of sub-contracts for U.S. and Canadian military aircraft and parts for the Boeing 747 and 767 airliners. The military aircraft involved in this research. in this programme include the Lockheed P-3C Orion, the Mc-Donnell Douglas F/A-18 Hornet and the Lockheed C-5B trans-

Besides its work on manned aircraft, Canadair is also developing or producing various unmanned remotely - piloted vehicles for military roles such as surveillance and target acquisition. One is the CL-289, based on the existing CL-89 system, still in production.

This is un interpretable to the care of the

This is an international programme, in which Canadair is linked with Dornier of West Germany, to develop a remotely controlled recoverable airborne system for accurate battlefield surveillance. Extensive trials have been conducted, and the company said recently that it expected a pre-production goahead on the programme by the end of this year.

seeking funds for full-scale en-Mr Gilbert S. Bennett, presigineering work, but meanwhile
dent and chief executive, has development would continue at

CONTINUED ON PAGE 13

Still keen to learn from West

Soviet Union MICHAEL DONNE

1 August 28 1984

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n der embe rareino E the Soviet Union rivals that of the U.S. in size and variety of

capabilities.

Precise statistics for the output of the Soviet aerospace factories, or details of the numbers of factories and people employed, are not publicly revealed; but that it is a very large industry is shown by the fact that it meets not only the Soviet Union's own total needs for civil and military alreraft and missiles of all kinds, and spacecraft, but also supplies much of the civil and military needs of the Warsaw Pact nations.

Other than the Warsaw Pact.

Other than the Warsaw Pact, however, and a few other countries such as Cuba, some countries in the Middle East and in South East Asia, Soviet tries such as Cuba, some countries in the Middle East and in South East Asia, Soviet and Nato forces prepared by Nato itself indicated that the Efforts some time ago to build up an export business in commercial airliners in Western countries achieved little success, and today that effort appears to be conducted in a low key.

Mato.

This technological inquisition appears to have paid dividends. A recent comparison of Soviet and Nato forces prepared by Nato itself indicated that the some 2,250 fighter-bomber air craft in Europe alone, against longer-range version, IL-96, now interceptor aircraft against nato's 795; and some 585 reconnics achieved little success, and today that effort appears to be conducted in a low key.

Moreover, says Nato, when it

space technology over recent years, the missions at the airspace technology over recent where it has often not kept pace shows are also intended to learn as much as possible about costs of entering new technology.

Some idea of the size and

Russian reticence

Western observers at recent Paris and Farnborough shows have noted the determination with which Soviet missions have collected information — freely available — on the Western aerospace industries' own progress while being reticent about gress while being retitent the Soviet Union's own achieve-

Soviet developments are societies in order to acquire but the comparisons do indicate the latest development being to be simed more at impressing ment and know-how". The existence of an immensely ment and know-how ".

One reason for this decline industry capable of a wide specific with the existence of an immensely ment and know-how".

ning orders for the products ship is that the resources involved.

At the same time, however, despite the undoubtedly rapid strides made by Soviet aero-aerospace is concerned, are much present than in the West aerospace is concerned, are much greater than in the West,

> complexity of the Soviet aero-space industry, and of its tech-nological capacity, was given earlier this year in the same Nato force comparison men-tioned above. This showed that in 1983 the Warsaw Pact countries, primarily supplied by the Soviet aerospace industry, had up to 400 supersonic bombers of the Backfire, Badger and Blinder types, against nil for Nato.

appears to be conducted in a in the lead.

2,990.

Moreover, says Nato, when it one figures must be viewed spraying and similar duties, international air shows, such as international air shows, such as international air shows, such as the figures must be viewed with caution, for the Nato international air shows, such as international air shows, such as the figures must be viewed with caution, for the Nato international air shows, such as international air shows, such as international air shows, such as in the lead.

2,990.

Moreover, says Nato, when it one small Na-20 through one of them was photographied take-off fighter for naval and unmanned, it is probably of test centre late in 1981.

Soviet aerospace technology as in an experiment of the small Na-20 through the spraying and similar duties, test centre late in 1981.

Moreover, says Nato, when it to be to its advantage with caution, for the Nato international air shows, such as in the lead.

Moreover, says Nato, when it to be to its advantage with caution, for the Nato international air shows, such as international air

'Design Bureaux'

The structure of the Soviet terospace industry is based or a series of "Design Bureaux," headed originally, and in some cases still headed, by some of the most famous names in projected These isolvide Autory. aviation. These include Antonov Bureau, primarily involved in the design, development and manufacture of a wide variety of transport aircraft, for civil and military purposes, with a very large four-jet aircraft, the An-400 now under development. Bureau is responsible for Beriev amphibious aircraft and sea-planes. Ilyushin Bureau is

Ilyushin Bureau is also all-weather fighter, believed to primarily a transport aircraft builder, the IL-62M long-range four-jet transport being one of its most frequently seen aircraft in the West. The latest design is the IL-86 four-engined wide-bodied jet airliner, with a longer-range version, IL-96, now under development.

Kamov is primarily a helicopter producer, again with a Blackfack, now under development.

the MiG-31 Foxhound A (Its Nato code-name) supersonic combat aircraft. Mil Bureau, originally founded by Mikhail L. Mil, is another helicopter organisation. It builds larger aircraft than the Warner aircraft than the Kamov Bureau, such as the Mil Mi-26 vehicle-carrying, eight-bladed-Rotor helicopter.

Myasischev Bureau is responsible for strategic long-range bombers and other aircraft, including the Bison maritime reconnaissance aircraft often seen around the Atlantic shores of Western Europe, where it is intercepted and escorted away by Nato fighters.

Sukhoi Bureau is another major fighter producer, whose latest development appears to be the Sukhoi Su-27 supersonic all-weather fighter, believed to



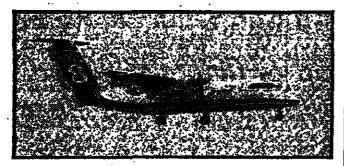
heaviest helicopter yet flown anywhere in the world, and has set a number of world records for lifting heavy payloads to great heights—for example, on February 2 1982, it lifted a 16,000 kg payload to 20,997 ft. Powered by two Lotarev D-136 turbo-shaft engines, the Mi-26 is also the world's first helicopter to have an eight-bladed main rotor

designated Tu-204, to replace sive Soviet airline which car- lent of the U.S. Space Shuttle the ageing Tu-154 three-engined ries both throughout the USSR airliner of which several hun- and internationally a total of dred have been built. The well over 100m passengers a Tu-154 is a familiar sight at year, indicates that transport

port system, it is known that it has ideas for such a develop-ment and that experimental

Tu-154 is a familiar sight at Western airports,
Finally there is Yakolev Bureau, which specialises in smaller transport aircraft such as the Yak-42 three-engined medium-range airliner. It also builds combat aircraft, such as the Yak-86MP Forger vertical take-off fighter for maval duties on board aircraft carriers.

Soviet missile technology has also expanded swiftly in recent take-off fighter for maval duties on board aircraft such as coupled with increased space ventures, both manned it is probably spear-heading the advances of Soviet aerospace technology as a whole. for deployment in the early



The twin-engined Dash 8 turbe-prop is the latest regional and commuter airliner to emerge from de Havilland Aircraft of Canada, long famed for its line of quiet short-take-off-

Federal funding in Canada

CONTINUED FROM PREVIOUS PAGE

the current rate. Marketing re- growth will be increased mill-

Pratt and Whitney Canada is now the world's leading manufacturer of small gas turbine engines for business and com-

New engines for business and commuter aircraft in 1983 accounted for about 45 per cent of PWC's sales, lower than normal because of the depressed state of the industry through the recession. Total after-sales of PWC's business, growing in importance because of the increasing in-service engine population

lation.

The remaining 15 per cent of sales relate to industrial gas turbines, marine systems and other equipment. PWC's main competitors are Garrett, General Electric; and Allison, all of the U.S., and Bolls-Royce of the Capected to total about C\$5bn over the next five years, growing anymatically at about 28 per cent

U.S., and Rolls-Royce of the U.S. and Rolls-Royce of the U.S. The recession dramatically cut industry demand for small airliners in 1982 and continued in 1983. Estimated world-wide deliveries of turbo-prop and jet airczaft by U.S. mannfacturers for civil or para-military purposes fell from 1,782 in 1981 to 1,065 in 1982, and further to 730 in 1983. As a result, PWC's 1983 sales fell to C\$409m, and operating profits declined.

Even so, the company says much progress was made in 1983. Foremost was an agreement with the Canadian Federal Government to provide C\$230m in 1983. Foremost was an agreement with the Canadian Federal Government to provide C\$230m in 1983. Foremost was an agreement with the Canadian Federal Government to provide C\$230m in the PW-3005 also has potential for civil ground based applications in the 1990s.

The PW-3005 also has potential for civil ground based applications in the 1990s. In turbo-fans (jets) the market is expected to grow at an average annual rate of 18 per cent, and total about C\$5bn. With its JT-15D turbo-fan in the 2,000-3,250 lb class, PWC has a wide market.

PWC won 11 of the 15 new has a wide market. engine competitions it entered in 1983, its engines, being selected for the new Beechcraft, the Cessna military trainer, the new Fokker F-50 airliner, the mew Fokker F-50 airliner, the mitsubishi Diamond executive aircraft, and the Learjet/Rinaldo Piaggio GP-180 joint venture.

PWC says that during the next five years, with an average next five years, with an average annual growth rate of about 20 per cent, demand for small gas turbine engines for small airliners, executive aircraft and military trainers should rise to more than C\$1350n. But this growth begins from a low 1983 base, and in part will result from the rapid growth of regional airlines in the U.S. resulting from the air transport deregulation there.

Other factors behind the

views had confirmed that there was a "very large potential a growing civil helicopter market," which the company intended to attack.

Seas markets, especially in the company intended to attack. seas markets, especially in the Third World, and greater

Turbo-prop engine sales are expected to grow at an annual muter aircraft. Its engines are rate over the five years of 19 also used in helicopters and industrial applications, with manufacturing centred in market with its PT-6 and PW-100 Series turbo-prop

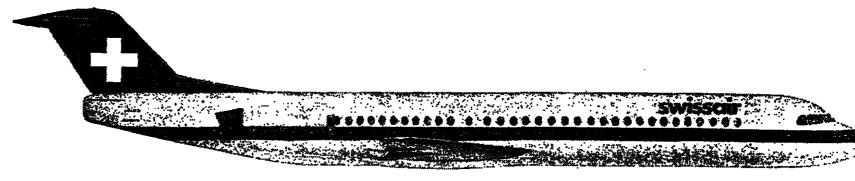
The PT-6 powers such aircraft as the Shorts 330 and 360, de Havilland Canada Twin Otter and Dash 7 airliners, while the new PW-100 Series in various models will be used in a raida manage of aircraft. in a wide range of aircraft.

These will include such air-liners as the DHC Dash 8, the Brazilian Embraer Brasilia, the Aerospatiale/Aeritalia ATR-42,

alreraft currently under development. PWC says its strategy for the turbo-prop and turbo-fan market is to increase its share of the civil engine categories, establish a significant presence as a sup-plier of U.S. military engines,

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Civil and military ventures ensure healthy workload

The UK

MICHAEL DONNE

THE PAST YEAR has been a good one for the UK aerospace industry, with a number of tender for the power-plant con-major new ventures launched in tract for the big EH-101 Angloboth civil and military aircraft Italian civil and military heli-and in guided weapons. For the copter, now under development immediate future, several other both for commercial use, and as major new ventures are on the a replacement for the Sea verge of Government decisions King in the RAF and Royal

One indication of the improving situation in the industry is that at June 30 this year, the order book of British Aerospace, the aircraft, missiles and space group, stood at about £5.2bn, against £4.9bn at the end of 1983. BAe's sales in the first half of this year amounted to \$100m for the development of \$100m for the \$100m fo half of this year amounted to about £1.08bn, against £1.04bn in the corresponding period of f55m, against £36.5m in the same period of 1983. The major new ventures already launched include

already launched include development of the European A-320 150-seater Airbus, to help complete the family of commercomplete the family of commer-cial airliners coming from the Airbus Industrie consortium. The UK Government is provid-ing £250m towards the UK's share of the costs of this venture, leaving British Aerospace (which is building the wings for the A-320) to find more than £400m from its own resources to complete the UK's overall share. The A-320, with French, West German and Spanish participation, is due to enter service in 1988.

Along with that decision, the Along with that decision, the existing Jetstream 31 twin UK Government has also subscribed £60m for the Rolls-Royce share of the new International Aero-Engines constitum's V-2500 engine, described to power not only the Airitage on continued development of its civil aircraft range will thus bus A-320 but also any other new-generation 150-seat air liners that may emerge in the mid to late 1980s Rolls-Royce British Aerospace is continuing iners that may emerge in the mid to late 1980s. Rolls-Royce British Aerospace is continuing has a 30 per cent share in this to build the single "demonventure, as has Pratt and Whitney of the U.S., with other participants including Fiat Aviazione of Italy, Motoren-und Turbinen Union of West Germany and Japanese Aerogengine Tapanese aero-engine but well before then it is hoped.

Rolls-Royre continue to develop the advanced E-4 version of its RB-211-535 engine, currently used in the Boeing 757 twin-engined jet airliner. Rolls-Royce itself has also

launched a new engine, the RTM-322, in conjunction with Turbomeca of France, which is initially intended as a conwhich, if favourable, could Navy, and for use by the Italian ensure for the UK a substantial navy. The Government is subaerospace work-load through the rest of the 1980s and beyond.

One indication of the improvement of the commercial version of that helicopter, with the funds for the military

the new Advanced Turbo-Prop (ATP) twin-engined airliner, a in the corresponding period of 64-sealer to complement the first half were estimated at 55m, against £36.5m in the same period of 1983. ventures so as to continue in production for some time to come.

Private venture

BAe is also funding as a private venture the further development of the Type 146 four-engined jet feeder-liner, with a Series 300 version seating 125 passengers now being seriously considered, and likely to be given the go ahead soon, while the smaller 80-109 seater Series 100 and Series 200 versions continue in production.

At the same time, BAe is continuing development of its existing Jetstream 31 twin



The British-designed and built Turbo-Firecracker, by NDN Aircraft of the Isle of Wight, is being offered by Firecracker Aircraft (UK) as the British entrant in the RAF's new basic trainer contest. The aircraft is already on order for training use by Specialist Flying Training of the UK. Right: The British Aerospace BAe 146 four-engined jet feeder-liner is now in

Even if earlier difficulties in Even it earlier difficulties in reaching agreement on a common programme eventually prove insuperable, preventing the kind of European collaboration that most aerospace industry leaders want to see, the existence of the advanced EAP in the UK, which is being injusty funded by both the UK. jointly funded by both the UK Government and the industry (including British Aerospace, Rolls-Royce and several of the major equipment companies), will ensure that if necessary the UK could so shad either the UK could go ahead either alone or with a smaller interconsortium than originally envisaged.

Several other major programmes are likely to result in decisions in the not too distant future, which will also help to swell employment in the UK industry, and keep its design teams busy into the 1990s.

Work worth £200m

One is the decision on which aircraft to buy as the next basic trainer for the RAF, to replace the ageing Jet Provost. There are four contenders for a 155major Japanese aero-engine but well before then it is hoped that it will have become the entirety in the UK by Short these aircraft. Earlier this year, the nevertheless make a significant that the same time, the Government has subscribed further launch aid to help the same embracing selected would be built in its could be used to power any of ing effective international columns are the tent of the used to power any of ing effective international columns aircraft. Earlier this year, the nevertheless make a significant that whichever infrastructure costs involved, company won a contract for the contribution especially in the one is chosen will be required the differences of language, and supply and support of 18 Sherpa construction of small, light military and commercial types.

the West German, French, Ralian and Spanish aerospace Aerospace, the remainder being industries in addition to the built by Pilatus, either in Switzerland or in its own UK factory at Bembridge in the Isle of Wight; and the Australian Wamira II, which if selected would be built in the UK by Westland Aircraft of Yeovil.

Whichever way the RAF's

trainer in RAF service, with a substantial volume of equip-ment being provided by the ancillary and component ancillary industries.

Yet another decision awaited

is on the provision of a new tactical transport helicopter for the RAF, to replace the ageing Wessex. Here also the order is likely to be for up to 125 aircraft worth well over £200m, to meet what is called Air Staff Target 404. Three aircraft are in the running — the Westland W-30-404, a development of the Lynx multi-role helicopter; the U.S. Sikorsky S-70A Black Hawk, already extensively used

quantity production to meet the requirements of regional and commuter-type airlines throughout the world. The aircraft has already been sold extensively into the U.S. and elsewhere, and production is geared to increase next year, to meet the rising order book. The aircraft is shown over San Francisco in the colours of Pacific Southwest Airlines of the U.S., one of the

tures, the one significant fact that emerges is that interna-tional collaboration is involved. The heavy costs of design, deve-lopment and manufacture of any new aerospace product, whether civil airliner, combat aircraft, helicopter or aerodecision goes, therefore, some aircraft, helicopter or aeropart of the UK aerospace industry will benefit by some £200m single-company and even singleof direct aerospace manufacnation activities. The more

> strong protagonist of inter-national aerospace collaboration —Concorde, Airbus, the Jaguar and Tornado military combat aircraft, the Anglo-French helicopter programme and many missile and engine ventures —

UK invests £370m

all illustrate its willingness to

International collaboration is increasingly becoming the only way ahead for new, very high are rour contenders for a 155aircraft, £200m RAF contract.
They are the British-built Firecracker; the Brazilian-built
Embraer Tucano, which if
selected would be built in its
entirety in the UK by Short

The new Rolls-Royce/
could be used to power any of
these aircraft, and it is comlaboration

way ahead for new, very high
cost civil and military aircraft,
missile and space programmes
either aircady under way, or
mooted for the future. Despite
the real difficulties in achieving effective international collaboration.

substantial further quantity of desires for project leadership UK equipment being installed. that bolster individual national In all of these aircraft ven. pride — the real benefits of cost-sharing, and bigger producand more programmes will

The other major factor behind these programmes is that they are intended to be turing activity.

In addition, there will be substantial support costs over the 20-plus years' life of the basic trainer in RAF service, with a substantial volume of equipment being provided by the ancillary and component

The UK has always been a component turing activity.

In addition, there will be substantial companies, and those), are expected to find example of international companies, that can be makets in the 1850-antides. The UK Government, international companies, and those international companies and the international companies and those international companies. mercial returns on its money.

The UK's other major fixedwing aircraft manufacturer, the state-owned Short Brothers of Belfast, continues to flourish across a wide field of activities, covering fixed-wing aircraft, guided weapons and aircraft components of many kinds.

In aircraft, the company builds a "family" of small, light transport aircraft, ranging upwards from the Skyvan freighter, through the Type 380 30-seat and larger Type 360 36-seat twin-turbo propeller of Jav engined commuter airliners, with freighter and military variants of which to date total sales amount to more than 400 aircraft property of the communication of th

from the U.S. Air Force, with

£25m a year in new technology and capital equipment, and this has enabled it to widen its product range substantially, especially in the "aerostructures" field, involving manufacture of parts for other aircraft. The company builds engine pods for the Rolls-Royce RB-211 engine, and recently won a contract to design, develop and manufacture the "super-critical" wings for the new Fokker F-100 twin-jet airliner, thereby continuing an association that has involved making wines for the F-28 twintures" field, involving manumaking wings for the F-28 twinmaking wings for the F-28 twinjet for many years. Other components built by the company
cover inner wing-flap assemblies
and nacelle nose cowls for the
Boeing 737, main landing gear
doors and nose cowls for the
Boeing 747, and complete
nacelles for the BAe 146
regional jetliner.
Shorts is also planning with
Embraer of Brazil to be resoonsible for the manufacture

sponsible for the manufacture in the UK of the Tucano basic trainer, if that is selected for the RAF, but of equal significant of the trainer. cance is the agreement with Embraer to design and probthat they are intended to be ably also develop the next wealth creators, not wealth con-sumers. Each and every one, liner that will follow the 360 other than the military ven-and Embraer Brasilia in world tures (and even many of markets in the 1990s—another those), are expected to find example of international col-

weapons systems to more countries than any other British manufacturer. The Seacat and Tigercat missile systems are used by over 20 nations, and the Blowpipe shoulder - launched missile has been selected by 16 armed forces in 11 countries.

An advanced development of the Blowpipe, called Javelin, was announced last year, and earlier this summer a further contract won from the Ministry of Defence worth over £35m was placed for the Javelin ground-to-air missile systems, bringing total world-wide sales of Javelin to date to over

The UK industry also includes a handful of smaller fixed-wing

an option on another 48, worth in all over \$660m. The first in the Isle of Wight now owned Sherpa was rolled out of the Belfast factory recently.

Shorts has been investing in tary Islander twin engined light recent years at a rate of up to transports. Also in the Isle of \$25m a year in new technology Wight is NDN Aircraft, which has built the Turbo-Firecracker military trainer now on offer to the RAF as a possible basic trainer to replace the ageing Jet Provost, and which is being marketed by Firecracker Air-craft (UK). NDN also has under development an agricultural air-craft, the NDN-6 Fieldmaster.

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Also now making a significant Also how making a significant contribution to export sales is the Edgley Optica, built by Edgley Aircraft at Old Sarum, near Salisbury. This unique fixed-wing three-seat observation aircraft has been nicknamed "Bug-eye" by many because of its large bulbous cabin providing a wide-angle view, which in conjunction with the aircraft's slow fiving speed makes if slow flying speed makes it highly suitable for surveillance roles of all kinds—such as police, customs, coastguard duties, pipeline inspection, and aerial photography.

aerial photography.

Skingsby Aviation, at Kirkbymoorside in Yorkshire, manufactures the T-87 light trainer, with
especialy emphasis on the
T-87M Firefly 160, a two-seat
military basic trainer version.
Slingsby also makes the gondola
and propulsion ducts for the
Airship Industries' Skyship 500
airship.

Delays in U.S.

Efforts to establish a production line in Northern Ireland to build the U.S.-designed Lear aircraft making extensive use of composite materials, such as graphite/epoxy, have been severely delayed owing to design and development prob-lems with the prototype in the

The UK also now has a small but vigorous airship manufacfacturing company, Airship Industries, which has already built a number of snall 12-seat Skyship 500 craft, with craft already delivered to customers in the U.S. and Japan, while it is also now developing the larger, 20-passenger Skyship 600. One of the company's Sky-ship 500s has been used over Los Angeles for TV coverage of Los Angeies for TV coverage of the Olympic Games. Airship Industries, which is now con-trolled by Mr Alan Bond, the Anstralian entrepreneur, is seeking additional UK Govern-ment funding to help develop larger airships.



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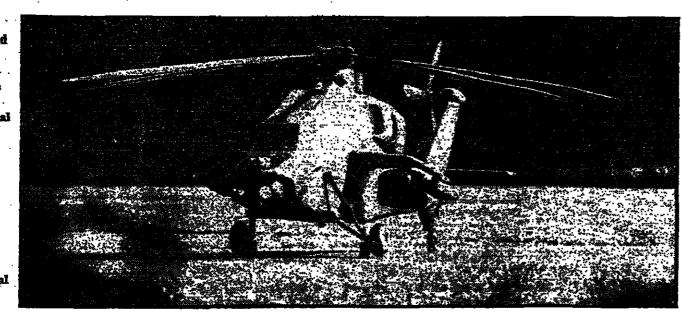
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Collaboration's charms grow

France DAYID MARSH

THE FRENCH aerospace indus try is guarding against a mood of celebration following its two successes earlier this month: another flawless launch of the Ariane space rocket and the placing of France's first commercial telecommunication. satellite, Telecom 1

Back on the ground there is much room for caution about the future. This is underlined by the sharp swing into a FFr 358m loss for 1983 at the prime aerospace company, the state-owned Aerospatiale, and the 46 per cent plunge in orders received by the aeronautics

industry last year. Summing up the feeling that the French aerospace sector is still not out of is bout of turbulence, Général Jacques Mitter-rand, president of the industry's professional association, Gifas, has recently expressed fears that last year's stagnation is continuing in spite of a pick-up in activity in some sectors like

of world competition. deals so as to ensure an accept-

able volume of future orders. With the French military and civil market clearly too narrow ambitions, and orders of fighter aircraft and other military equipment to traditional clients reached between Paris and to FFr 12.9bn. in the Middle East falling off as Bonn in May previews foint studies of a military observational improvem this year, with to satisfy the manufacturers' French aerospace companies are turning ever more closely to European collaboration deals.

Aerospatiale, as the prime industrial contractor for Ariane, and with more than 25 years of Boelkow-Blöhm (MBB) in civil aircraft, missiles and satellites, is no stranger to European link-

ups.
But it is significant that all this year's milestones in French aerospace concern European deals where governments and industries are trying to act in harmony to stand up to U.S. competition.

cent of sales, the sector is more and the five-nation accord in a combine than ever exposed to the winds July to press sheed with feasi-

to the Transell military trans-port aircraft, where Aero-

studies of a military observa-tion satellite, furthering the existing Franco-German collab-first five months of the year up existing Franco-German collaboration in civil satellites, while two-nation period of 1983. But compared that the two-nation period of 1983. But compared the foreign competitors Paris hopes that the two-nation period of 1983. But compared combat helicopter deal could with its foreign competitors eventually include Britain as notably Boeing, Aerospatiale

"One can no longer develope big projects except through international collaboration," says M. Jean-Charles Poggi, Aerospatiale director in charge of spatiale director in charge of controlled military fighter manufacturer, which makes the collaborated Mirage, also suffered strategic planning and budgets. He compares building up for-eign collaboration to mixing a good mayonnaise, starting off down more than 30 per cent with well-tried partners such as to FFr 20.7bn, above all because

combination of difficulties.

They include poor sales of

possible multi-hational follow-in craft, a continuing slump in to the Transall military transport aircraft, where Aerospatiale, British Aerospace, sion which best resisted the previous year's downturn—tacalready formed a joint study group.

In addition, the accord last year dropped 18 per cent proched between Paris, and to EFF 10 other samples.

Aerospatiale expects a gradwell.

"One can no longer develop costs as a result of its extremely limited scope for work-

celebrated Mirage, also suffered a sharp fall in orders last year of a drop in military exports. But Dassault-Bréguet, in which the Government has a

bility studies for a European the A-300 and A-310 Airbuses, 2000 jets has just entered It is also becoming increasing increasing fighter aircraft for the 1990s.

It is also becoming increasing fighter aircraft for the 1990s.

Waiting in the wings are extra provisions to cover incomplex questions of international collaboration possible multi-national follow-in craft, a continuing shump in prospects by announcing a deals so as to engine an accept. prospective purchase of fighters.

Dassault-Bréguet has also just unveiled its new Falcon 900 luxury executive jet, designed to boost its position on the civil market. It has faced complaints from U.S. aircraft makers about allegedly unfair French Government support for the Falcon development.

M Benno-Claude Vallières, the doughty 73-year-old chair-man of Dassault-Bréguet, ripostes that government support for his company—as with Aerospatiale—is in the form of repayable loans; and he points out sharply that the Falcon actually gives employment to the U.S. aircraft industry through engine and equipment

nurchases.

In another international tussle, in the fighter project with Britain, West Germany, Italy and Spein, Dassault-Bréguet has made a strong pitch for overail technical leadership.

The problem over a located in the located

continuing in spine of a pick-up in activity in some sectors like civil aircraft engines.

Last year the French aerospace industry achieved a turn-over of FFr 60.3hn, roughly the same as 1962. With exports last joint construction of a Francoyear totalling FFr 38.6hn, 65 per German anti-tank helicopter; and the five-nation accord in a combination of difficulties.

Satellites

Satellites

Satellites

Aerospatiale's problems last profits of means ended the dispute for the first time in five year—when it dipped into the red for the first time in five years and more than doubled years and more than doubled its debts to FFr 6.8hn—reflect as combination of difficulties.

The description of a profits of means ended the dispute for the first time in five year and more than doubled groups which actually gives a return to taxpayers.

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The first area of the profits of means ended the dispute for the first time in five year and more than doubled groups which actually gives a return to taxpayers.

The first area of the first month has between Dassault and British or the first time in five year and more than doubled groups which actually gives a return to taxpayers. return to taxpayers, the fighter before the first of the new Mirage can be reached.

Communities vie for helicopter offset work

Belgium PAUL CHEESERIGHT

THE leading Beigian aerospace companies are searching for new products to lessen their dependence on military and other Government contracts. The general recession in the

industry has again shown how vulnerable is a sector that epends largely on sub-contracting work or component manu facture for projects conceived abroad.

Rut the increasing need for the world's airlines to renew their fleets and the extensive work being done internationally on new types of aircraft offer a hope to set against the fact that the three companies on which the Belgian industry is built have all suffered or expect to suffer lower profits.

These three are Fabrique Nationale (FN), the old-estab-lished armaments and engines group; SA Belge de Construc-tions Aeronautiques (Sabca); and Société de Construction Aerospatiale (Sonaca).

State funding

The problem is that the akening effects of the recession have exposed financial difficulties that have made almost inevitable some degree of state funding if the companies are to take part in the research and development activi-

ties that assure their future. But state funding in Belgium is not simply a question of deciding industrial priorities. The communal and linguistic division of the country necessitates the provision of funds equitably between the Flemish speakers of the north and the French-speaking Walloons in the

The preliminary accord in the Government starts, over the Madrid last month has by no next few months, active negotiameans ended the dispute tions to buy a new fleet of helibetween Dassaukt and British copters for the Belgian armed tions to buy a new fleet of helicopters for the Belgian armed forces, and Flemish interests in the north are already claiming nated by Snecma of France 100 per cent of the expected offset. But traditionally the arms industry has been based in Wallonie, particularly at Liège.



The A 320 twin-engined 150-seater is the latest model of the The A 320 twin-engined 150-seater is the latest model of the Airbus to be put into development by Airbus Industrie. In addition to the principal partners from the UK, France, West Germany and Spain, there are associates such as Belairbus of Belgium and Fokker of Holland. The A-320 will enter service in the spring of 1988. Cyprus Airways is one of the early purchasers of the aircraft.

Meanwhile, decisions have had

Belgium has a 2 per cent stake in the new short-haul Airbus programme, largely in the role as a sub-contractor to British Aerospace, which manufactures wings for the aircraft. This has been arranged through Belair-bus, which acts as a corporate bridge between the companies and the project managers.

The Government is providing BFr 1.1bn for research and development costs. Between them, Sonaca, Mechanische Constructie Watteeuw and Asco will be making slats and rails for the Airbus wings and it is calculated that the work should bring in annual revenue of BFr 850m

south. This is not a new problem in Belgium.

The key test will come when the Government starts, over the already doing on the A-310 Airsouth. This is not a new problem in Belgium.

For Sonaca this will be a Fokker for work on the new continuation of work it is fokker F-50 airliner.

Small aircraft will continue to

The CFM 56-4 programme conof the industry. Souaca has
cerns FN, which is taking 5 per
cent of an engine project dominated by Snecma of France
and General Electric of the U.S. Foxjet International of U.S. is

But the cost of participation for FN is BFr 1.9bn, Because of participation in continuing programmes. In mid-July participation in the Airbus A-320 and the CFM 58-4 engine programmes of BFr 695m for research and development. But In the period from 1987 to 2000 FN could reserve revenue of BFr 15bn at constant values. Certainly the programme comes as a valuable addition to FN's military aero-

engine activities.

The worksday reality of the industry as it looks to the future is less glamorous than these two major projects, however. The manufacture of parts for the F-16 fighter alreraft, for example, looms large in the industry, accounting for 55 per cent of Sabca turnover.

Licence

Sabca and Sonaca last year received U.S. maintenance contracts for the F-16, while Sabca

play a part in the development planning a BFr 4.6bn invest-ment in a plant in Limbourg

for increasing a nation's surveillance and reconnaissance capabilities with a single affordable and versatile aircraft type.

How to achieve flexibility and cost-effectiveness in airborne information-gathering systems:

The need: In today's political, economic and social environment, every country, large or small, has a need to know what is taking place along or near its

national boundaries. Keeping informed of events or situations that can affect its resources, political structure, military deployment—even the welfare of its citizens—is an activity that deserves the highest priority in planning for the protection and preservation of a government's

Airborne electronic surveillance equipment and systems provide fast, effective ways to gather the necessary data from which these timely assessments and decisions can be made. By sending or receiving electronic signals, sophisticated devices can "look at" objects and terrain, or "listen to" other emissions and transmissions, and identify their sources and

Unaffected by weather conditions or darkness, these systems not only permit passive informationgathering missions to be conducted over wide areas from high altitudes, but also from within the security of a nation's own borders when the occasion demands. Their effectiveness, of course, is directly related

It stands to reason that the most suitable aircraft for conducting such vital missions would be one with sufficient size to carry the equipment and operators, several hours of endurance, fast cruise and dash speeds, high operating altitudes, good handling characteristics in all flight regimes, and unquestioned

dependability of engines, flight systems and airframe.

Ideally, it also would have affordable acquisition costs, and be cost-effective in its operation, maintenance and support.

Gulfstream Aerospace has developed exactly that platform: the Gulfstream SRA-1.

The solution: The Gulfstream SRA-1 is a specialized derivative of the highly successful Gulfstream III executive jet transport, of which nearly 150 are in service with many of the world's leading corporation's and governments.

It meets perfectly the requirements of any government for airborne information-gathering systems with a platform that is fully capable of performing these missions, is affordable and cost-effective.

The Gulfstream SRA-1 can be made available with fully integrated systems designed to satisfy the operator's requirements for one or more of the following missions: (1) Electronic Surveillance;

The proof: The concept of using the basic Gulfstream airframe for missions other than executive transport has been convincingly demonstrated by the Royal Danish Air Force, which operates specially equipped Gulfstream jet aircraft for maritime surveillance, fishery inspection, medical evacuation, priority cargo and administrative transport.

In these applications, the aircraft has proven that it can effectively perform missions that require any combination of endurance, size, speed and performance flexibility under the broadest range of operating conditions.

The aircraft: While it retains this unique versatility, the Gulfstream SRA-1 capitalizes on the long range, high operating altitudes and stable flight characteristics of the basic Gulfstream aircraft to provide an ideal platform for the most sophisticated airborne surveillance and reconnaissance systems, either electronic or optical, or both.

The Gulfstream SRA-1 satisfies these requirements for a superior data-gathering aircraft: Long range: IFR range of 3,600 nautical miles (6,671 km) with adequate fuel reserves provides airborne endurance in excess of 8 hours at long range wide range of conditions, such as hot days and higher elevation airports.

 Engine reliability: Rolls-Royce Spey Mk511-8 turbofans combine extremely high levels of in-flight and on-time departure reliability with excellent cruising fuel efficiency at airliner speeds above 40,000 feet (12,192 m); and offer maximum operational flexibility throughout all flight regimes.

 Cabin size and environment: A flat floor and over 6 feet (183 cm) of headroom extend the entire length of the cabin, or nearly 42 feet (12.8 m). Cabin volume totals approximately 1,500 cubic feet (42.5 m3). A superior pressurization system maintains cabin altitude at only 6,500 feet (1,981 m) at 45,000 feet (13,761 m) to enhance physical well-being and efficiency of the crew on longer missions at higher

The evaluation: We are confident that a thorough examination of the Gulfstream SRA-1 will show that it can meet all of your present and future requirements for an efficient, affordable surveillance/ reconnaissance aircraft.

To arrange a presentation of the Gulfstream SRA-1, or to obtain more information, please con-



Fokker draws new breath

The Netherlands WALTER ELLIS

THE announcement late last year that Fokker, the leading Netherlands aerospace group, was to develop two new aircraft, the Fokker F-50 prop jet and the Fokker F-100 jetliner, breathed new life into the company at a time when its long-term decline was beginning to seem insuriable. seem inevitable.

While the tried and trusty F-27 and F-28 airliners were and are—still selling, and the assembly of U.S.-designed F-16 fighters was going well, it was clear that the 1990s would re-

quire new aircraft. The two new Fokkers are now providing the basis for production well beyond the year 2000. Fokker has also kept up its interest in space projects, often in co-operation with other high-technology Netherlands companies, so that the country retains an active involvement in satellite development and

space probes generally.
On a personal level, a Dutch scientist, Dr Wubbo Ockels, has joined the crew of the American space shuttle Columbia, and is due to take part in a seven-day

mission next year. Dr Lodewijk van den Berg now a naturalised American—will join the crew of Spacelab 3

in 1988 could yet restore it to be available to customers. full working order and enable it once more to see through clouds of dust and gas deep into

the Galaxy.

Hollandse Signaal, a subsidiary of Philips of Eindhoven, is also involved in satellite technology, while DAF, the heavy vehicle manufacturer, now has a stake in the aircraft industry through repair and maintenance.

chemical experiments in space over a long period.

IRAS, the infra-red astroTay fan-jets said to be 15 per Swissair, the Swiss national

IRAS, the infra-red astronomical satellite developed jointly by the Netherlands Agency for Aerospace Programmes, NASA of the U.S. and the U.S. and the U.S. Science and Engineering Research Council, proved a considerable triumph for Netherlands technology before "expiring" last November.

Now there are tentative plans

of his new projects from Japanese industry. The outcome, in July, was a contract with Fuji sadly reduced. From its base beside Schiphol Airport, Amsterdam, Fokker is the nerve-centre and fulcrum of the Dutch aerospace effort. The

ment in aerodynamic efficiency. A launch-order for the F-50

"expiring" last November.
Now there are tentative plans to revive it. A shuttle mission and various interior plans will man of Fokker, visited Japan in February in a bid to secure and various interior plans will participation in either or both

centre and fulcrum of the Dutch that all Nippon (ANA) and aerospace effort. The two new civil aircraft it is now developing are expected to be among the most advanced of their kind coming fleet renews.

now has a stake in the aircraft industry through repair and maintenance.

More than 30 other Netherlands companies—many of them small—make their own, sometimes highly specific contributions using the services of the Eindhoven-based Netherlands Aerospace Group.

The F-100 should enter service a year later, in mid-1987, and will carry up to 107 passengers over 1,200 nautical miles at a speed of Mach 0,750.

The engines will be six
the most advanced of their kind in the world, embodying the experience gained from the F-27 and in the world, embodying the experience gained from the F-27 and F-28 into new programmes involving lightweight composite materials and the latest engines.

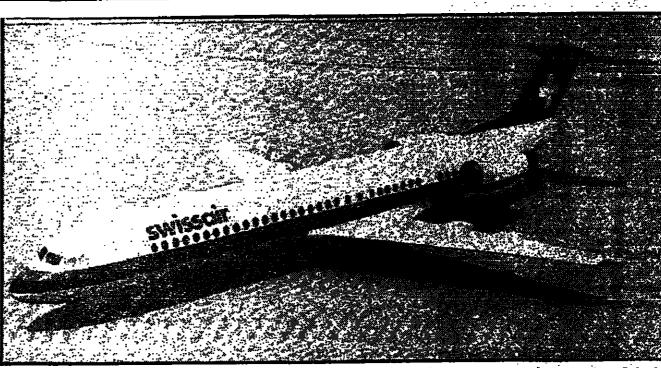
The Netherlands Government, which is anxious not only to maintain jobs at Fokker but is determined to retain major aerospace capacity in the country, has provided much of the cash for the current programmes.

Loans were agreed in March totalling FL800m. But the company is back in profit in any event, having recorded earnings of F1 18m in 1983. It is expected to perform well again this year.

sengers over 1,200 nautical miles at a speed of Mach 0,750.

Its wings, described as "supercritical," while have an area 18 per cent greater than those of the F-28 and are designed to produce a 30 per cent improvement in aerodynamic afficiency.

A launch-order for the E-50 of F1 18m in 1983. It is expected to perform well again this year. Sales of the F-27 and the F-28 which are intended to reduce a re-continuing, while the F-16 programme has been extremely beneficial not only in terms of income but through the addition



Fokker of The Netherlands has recently won its first order for its new F-100 twin-engined regional jet airliner from Swiss and is negotiating further contracts. The aircraft is powered by the new Rolls-Royce Tay jet engine, new under development and is negotiating further contracts. The aircraft is powered by the new Rolls-Royce Tay jet engine, new under development by the company, the other being the F-50, a twin turbo-propeller airliner seating about 50 passengers. The two aircraft will represent a major investment by the Dutch company in civil aerospace activities for the rest of this century.

Space opportunities beckon

Italy ALAN FRIEDMAN

THE director-general of Italy's state-owned Aeritalia Aerospace Company, Sig Fausto Cereti, leaned forward in his chair in leaned forward in his chair in his Rome office and began sketching a Space Station module on a piece of paper.

"We have just signed a memorandum with Messerschmitt of West Germany to co-operate on the Columbus," he

"We believe the Columbus space project could be the European answer to President Reagan's invitation for Europe to participate in the Space Station programme," he added. Aerospace executives the world over tend to get rather excited when discussing new systems and new products. Sig Cereti, whose Aeritalia has generated a number of new pro-ducts in recent years, is no

He hopes the Italian Government will provide at least \$500m for Aeritalia to join in a \$2bn. Space Station modules. This. in the aerospace business, is

Less exciting, and perhaps disturbing, has been the lack-lustre growth record of the talian aerospace industry ove the past year or so. Recession has meant slower growth for Aeritalia, while Agusta, the other major Italian state-controlled company, has undergone a painful reorganisation.

Last year, Aeritalia's turn-over grew only 7 per cent to L867m against an average Italian inflation rate of 15 per

real terms (despite a rise in profits to L11bn was disappointing for an aerospace group involved in a diverse range of products including the Anglo-German-Italian Tornado combat aircraft, the Italo-French ATR-42 turbo-prop commuter aircraft and the newer AMX light attack and battlefield sup-

While the Tornado and ATR-42 programmes are moving ahead, the AMX suffered a set-back in June when a test flight resulted in failure and the aeroplane crashed.

Sig Cereti says the crash is being investigated, but he disnisses any talk of a serious

last year, bringing total sales surplus in this sector. Last year to L1,100bn, about 20 per cent the positive trade belance was of Aeritalia revenues comes from sales of commercial aircraft and 70 per cent of sales come from military aircraft, while space-related work accounts for the last 10 per

are also making progress. In recent months, for example, and state-subsidised redundancies for 4,000 of its over L1,000bn, roughly equivalent to a year's work. One of Aeritalia's strengths, apart from its generation of new products and its recognised technical skills, is its ability to sell overseas.

Some 75 per cent of last year's group turnover came from exports, more than the

threat to the future of the AMX, which is being developed jointly with Embraer of Brazil. He admits, however, that the crash was not at all good for the image of the AMX.

On the brighter side he process the image of the AMX.

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On the brighter side he process the image of the AMX.

On the brighter side he process the image of the Italian January the UK and Italy unacross to provide £120m to develop this new military and civilian helicopter.

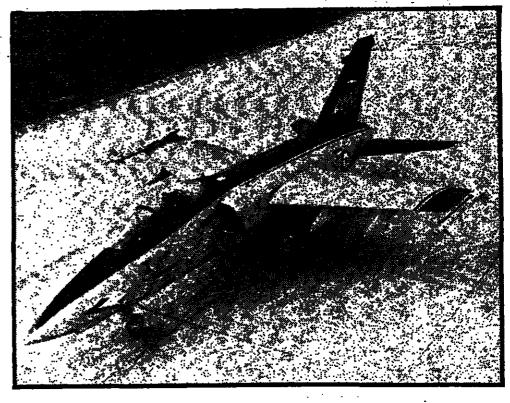
Participants in the joint process the image of the Italian January the UK and Italy unacross to provide £120m to develop this new military and civilian helicopter. He admits, however, that the crash was not at all good for the image of the AMX.

On the brighter side he predicts that 1984 group revenues ceeded over the last few years will show a 20 per cent rise on maintaining a healthy trade course or the last few years will show a 20 per cent rise on maintaining a healthy trade

> around L1,600bn. In addition to the two big state - controlled aerospace groups—Aeritalia and Agustaa variety of smaller companies are also making progress. In re-

Participants in the joint pro-ject are Westland and Agusta. The British and Italian navies are between them likely to order 150 of the military version and the two Governments hope that a total of 900 EH-101 helicopters will be sold even-

Agusta's problems, mean-while, have included a L165bn loss last year, the departure of its managing director, Sig Pietro



The Italian/Brazilian AMX light tactical fighter is now under development by Aeritalia and Aermaechi of Italy and Embraer of Brazil, Although the first prototype was lost in an accident earlier this summer, AMX development is continuing and a second prototype is due to fly soon. The aircraft is expected to enter service in 1987, with initial production of 266 aircraft planned. The power-plant is the Rolls-Royce Spey

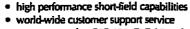
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Bell Helicopter TEXTRO

U.S. setback forces rethink

(CASA), received a bitter set- per cent stakes.

Rs previously highly successful C-212 Aviocar, a short takeoff and landing (Stol) light transport aircraft better known as the "Jeep with Wings," lost a key U.S. defence contract to its rival the Sherpa, built by Short Brothers of the UK.

The contract is to provide air.

The contract is to provide aircraft to carry parts and equip-ment for the U.S. Defense Department in Europe. CASA had high hopes of seeing the C-212 chosen for the European Distribution. System. Aircraft Distribution System Aircraft (Edsa) programme and saw the contract as a toebold in the rich U.S. market.

The failure to clinch the sales breakthrough, which would have accounted for at least 10 per cent of Aviocar production for the next five years, has had a sobering effect on CASA, which is the Spanish national aero-

This year Casa did not pay dividends. The Instituto Nacional de Industria (INI), Spain's State holding company, owns 72 per cent of CASA while the Northrop Corporation and West Germany's Messerschmitt-Bolkow-Blohm (MBB) hold reciones Aeronauticas SA

Aeronauticas SA

This year Casa did not pay dividends. The Instituto Nacional de Industria (INI), Spain's State holding company, owns 72 per cent of CASA while the Northrop Corporation and West Germany's Messerschmitt-Bolkow-Blohm (MBB) hold reciones are specially a per cent and 11 tedly modest quantitative information in Spain's participation of a joint venture with the Indonesian aerospace company P.T. Nurtanio. It will be officially demonstrated at the Farnsch tedly modest quantitative information in Spain's participation.

A total of 1,600 employees have been laid off for a year under the company's restructur-ing plans and CASA expects to save Pta 300bn over the current for the Airbus. and the next financial years. Capital has been increased by

Forward planning by CASA has concentrated on three specific participation projects and on the prospects for two of its own aircraft, both of which have made their first flights in the past year.

The most ambitious participation venture concerns the joint development by the UK, France, West Germany, Italy and Spain of a European fighter aircraft (EFA)—a scheme formerly known as the Advanced Combat Aircraft (ACA)—which aims to produce a European challenge to U.S. dominance of this sec-

SA spectively 13 per cent and 11 tedly modest quantitative in-set per cent stakes. tedly modest quantitative in-crease in Spanish participation is the nature of the contribution made to the A-320 project, for CASA is committed to de-veloping advanced technology

> The third participation pro-tect emerged in June when CASA signed a Memorandum of Agreement (MOA) with United Tehnologies' Sikorsky Aircraft for long-term industrial co-operation. Under the terms of the MOA. CASA will make major components for Sikorsky's \$-70/H-60 helicopter series and will be involved later in

final assembly and in flight The Sikorsky agreement is complementary to an existing pact between CASA and MBB which permits the production of parts and the assembly of MBB's BO-105 light helicopter in Spain. CASA management is hopeful, however, that the new relation-

This aircraft is a slightly bigger, faster and more comfortable version of the C-212 Aviocar—a "Range Rover with wings" against the C-212's "Jeep." Both aircraft have won high praise for their sturdiness and versatility. The CN-235 will be competing

directly with De Havilland Canada's Dash 7 and Saab-Fairchild's SF-340 among other middle-range turbo-prop passenger aircraft in the commuter/ utility category.

Like its competitors, CASA

believes that there is a potential market here for 1,800 civil aircraft and 600 more for military duties,

The other product is a new version, the C101-5, of CASA's advanced jet trainer the CIOL The new prototype, which has much improved avionics and pilot training potential, made its first flight at the end of last

is the Spanish national aerospace company.

At one level the management
has concentrated on setting its
financial house in order. At
another CASA is more determined than ever to seek participation in joint ventures and in
multinational aerospace projects.

The Defence Ministers of the
five countries concerned met un
Madrid last month to underline
the political commitment to
carry the programme through
more immediate task at CASA
is now studying further
development in other helicopter
programmes.

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To the Parket

RUPERT CORNWELL

THERE ARE two ways of looking at current developments in the West German aerospace industry. One view is that of Herr Hans Arnt Vogels, chief executive of Messerschmitt-Bölkow-Blöhm (MBB), the country's largest aerospace

Herr Vogels talks of a phase of "consolidation" after the hectic expansion of recent years and before an expected new take-off in 1987. But others are less optimistic. They believe "consolidation" might well be a euphemism for retrench-ment and cutbacks.

Incontrovertibly, though, MBB must be listened to. With almost 37,000 employees at the end of 1983, it accounts for around two-thirds of the total German

There is hardly a multi-national programme in which MBB is not the German participant, and the fortunes of the company, with headquarters in the quiet town of Ottobrunn, near Munich, are a key barometer of that ever-sensitive

topic—West Germany's ability to keep pace in high technology. MBB is now in the midst of a far-reaching programme of diversification. In both 1983 and 1984, its traditional aircraft building business will account for only half of total sales, of DM 5.9bn last year and a shade

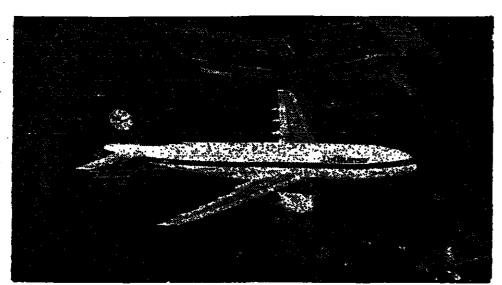
less this year.
Indeed, the greatest growth is expected in the space sector, while the company is moving (or has already moved) into areas like factory automation and high-speed magnetic trains.

Swirling changes

The slowdown likely up to 1986, if seen in a historical perspective, is in some ways no more than a reasonable pause to catch breath after a decade of swirling change. Ten years ago MBB's turnover was only DM 1.5bn. Since 1974 it has doubled its workforce, quad-rupled its sales, and also com-pleted its merger with VFW. formerly the second West German aerospace concern.

At the same time, diversifica-At the same time, diversification has been matched by a basic commitment to collaboration abroad as the road to steady expansion. Joint wenters, of course, have been customer, has said no; but Saudi sales of its defence division may the military side of the West German acrospace industry.

West Germany nave been completed in export orders will be part on from the existing pleted, export orders will be part on from the existing pleted, export orders will be part on from the existing pleted, export orders will be part on from the existing pleted, export orders will be part on from the existing pleted, export orders will be part of part of the fastest growth at MBB will ever. Greece, once a hoped for be on the space side. While customer, has said no; but Saudi sales of its defence division may the military side of the West Germany nave been completed. German aerospace industry, which covers about two-thirds



West Germany is a major participant in the European Airbus Industrie venture, with Luftbansa, the flag airline, a major buyer of both the large 250-220-seat A-310 Airbus above

and military aerospace projects air transport industry, now in 1987. Part of the reason is showing signs of coming to an the go-ahead for the A-320, for end. Military work remains which the company is a subshowing signs of coming to an the go-anead end. Military work remains which the contractor. It is pressure on the national defence budget and the financial weakness of Third World nations, which has cut deeply into export markets.

37.9 per cent stake. This year only 45 Airbuses will roll off the final assembly lines in Toulouse against 47 in 1983. Next year, MBB executives glumly forecast, the figure could drop to 35—and almost certainly cause lay-offs among German workers on the Airbus

The Bonn Government's approval of public funds for the development of the smaller A-320 Airbus will not immediately soften the blow. The first A-320 delivery will not be until 1988, and so far orders for the new aircraft have been sluggish.

The key military project is the Tornado strike aircraft, which is being produced by MBB at the rate of 42 a year. But when deliveries to the air forces of the three participant countries (Britain, Italy and West Germany) have been com-

But Allied unwillingness to the smaller privately-owned sirtolerate a fully independent craft manufacturer intergerman arms and defence industry has propelled West Germany to accept, perhaps more quickly than most, the inevitable that major defence and civil programmes are now beyond the capacity of a single country.

The trouble is that both civil

the smaller privately-owned sir manufacturer intermentation in the inevitably are inevitable. The real impetus came with the success of the Spacelab misbeling in the space division of the jewel of West Germany's space programme. It was handled mainly by MBB-yond the capacity of a single the Alpha Jet programme on which it had worked with Dassault of France,

The trouble is that both civil

are stagnating. Civil work has is looking for the rebound that mission is scheduled for the end been hit by the recession in the ought to come MBB's way only of 1987.

More importantly, Dormer is expecting space activities, and the success of its Do-228 feeder turboprop aircraft, at least to the success of the success of the mili-turboprop aircraft, at least to make up its losses on the mili-tary side. Dornier reckons that turnover will recover to but the most spectacular diversification of MBB could which more quickly, and Typical is the state of the European A300/310 Airbus programme, in which MBB has a DM 1.65bm in 1984 and plans to programme.

The reasons for Herr Vogel's longer-term confidence at MBB are somewhat more grandiose. one is the A-320, but the company is set to be the German partner in the "J-90" (Eurofighter) advanced combat aircraft, ratified in Madrid last month by five participating European Governments.

Agreement signed

West Germany will have 250

copter programme, Knking MBB grammes.

with the French State-owned Aerospatiale. The project will would help MBB in its ambition carry on from the existing of DM 1bn of new sales a year PAH-1 and BO-105 helicopter from the 1980s.

A similar cycle has already and other space activities will But Allied unwillingness to the smaller privately-owned air- DM 800m, against DM 337m last

This year, however, Dornier ject, called Eureca, whose first

MBB-ERNO is also heading a joint German-Italian study group which is due to make a detailed proposal—code-named Colombus—for participation in the U.S. Manned Space Station programme, after feelers were put out in a recent tour of

raise investment this year from come much more quickly, and DM 34.5m to DM 50m. has this summer confirmed his company's interest in securing effective control of Krauss-Maffei, the arms and locomotive building subsidiary of the Friedrich Flick industrial group, of which Herr Vogels was, until last year, a top manager before moving to MBB.

Flick is known to be interested in selling Krauss-Maffei, which makes the celebrated Leopard tanks. But the transaction has caused some of the 1,000-aircraft Eurofighter transaction has caused some programme, the largest multi-national defence venture since the Tornado.

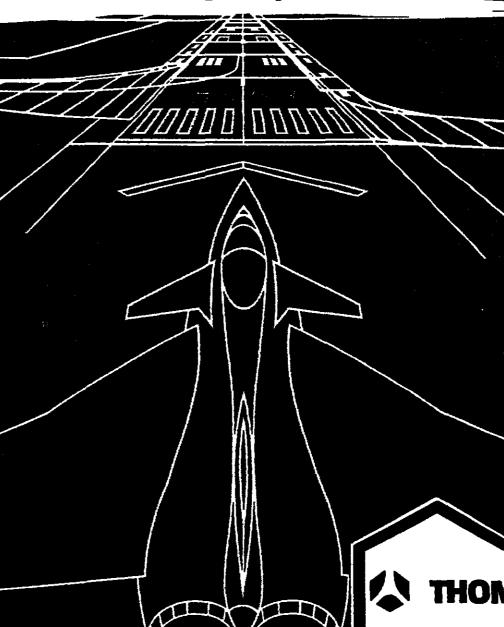
Six weeks earlier, moreover, and in the Bonn Defence Minian agreement was signed in stry, which is uneasy at having Bonn and Paris for the PAH-2 a single supplier at the other Franco-German military heliend of many procurement pro-

Many analysts believe that a compromise will be reached. MBB will get effective manage-ment of Krauss-Maffei but only through a consortium of new owners. These would embrace other West German defence concerns like the Diehl group of Nurambers and TWKA of Walk

ruhe.

Meanwhile, MBB is examining various joint venture possibilities in the U.S., Europe and Asia. The fields include elec-tronics, computer software and data systems. In view of Herr Vogel's observation that the electronics component of a new weapons system can reach 75 per cent, the trend is hardly

THE SYSTEMS APPROACH.



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FINANCIALTIM

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SAAB links with U.S.

Sweden

DAVID BROWN

THE AEROSPACE industry of Sweden now has its hands full with two major projects. First, it is breaking into the regional airliner market with its new SF 340 twin turboprop, which SAAB-Scenia is now mar-

keting in a joint venture with Fairchild Industries of the U.S. Second, it is trying to fend off threats to its next-generation military aircraft—the JAS 39—posed by increasingly expensive dollar-denominated foreign con-

On the commercial side, the SF 340 35-seat airliner has started rolling off the production lines in Linköping and is being delivered to customers in the U.S. and Europe following a four-year development pro-gramme and an investment of SKr 1bn.

To cut its dependence on military procurement, SAAB plans to raise its civil aircraft turnover to half its total avia-

If the SF \$40 project is to break even, officials estimate they will have to sell 200 aircraft, an estimated 10 per cent of the world market. About 130 aircraft are now on order. It is competing with de Haviliand Canada's Desh 8 and Embraer's Brasilia 120, among others. The basic model sells

The work has been divided so that Fairchild produces the wing assemblies, fin and interior, while SAAB is responsible for the fuselage and for final assembly in Sweden. The SF 340 is powered by General range of 1,500 km and 2 speed

On the military side, construction of the new JAS 39, already hard-pressed military duties, with minimal ground designed as Sweden's next budget.

These options may not suffice, on very short airstrips or rural



Agency to a special industry group which includes SAAB, Volvo and Ericsson, among others, for an initial batch of 30

Under threat

But the project is being threatened by the high propor-tion of increasingly expensive

The defence ministry may consider deferring some aircraft purchases and cutting back on weapons systems rather than face a controversial re-

amuter airliner. Above are four of these 34-pa

now the largest industrial project in the country.

It calls for delivery of some 140 aircraft, together with weaponry and equipment to a total value of SKr 32.7bn. A SKr 10bn contract has already been awarded by the Swedish Defence Materials Procurement Agency to a special industry craft reaches the production of th

(the F-404 engine), Lear Slegler (electrical flight systems) and British Aerospace, which beat Rockwell to develop the all-composite wing. SAAB-Scania is responsible

for 60 per cent of the work indollar-denominated foreign contract, some 27 per cent of the total, and an estimated SKr is co-producing the single engine gramme to market similar is co-producing the single engine gramme to market similar is co-producing the single engine gramme to market similar is co-producing the single engine gramme to market similar is co-producing the single engine gramme to market similar is co-producing the single engine gramme to market similar in the services in Scandinavia and European Group is making the radar, sender and target acquisition systems integration. Volvo Like its predecessors Viggen and Draken—the JAS 39 Gripen is designed for attack,

craft reaches the production experimental period ending in stages.

Among the major foreign subcontractors are General Electric radio and data transmission services of the Nordic countries.
L. M. Ericsson is to produce advanced payload components, while SAAB-Scania will provide the platform guidance system as well as other computer and structural elements.

two 14-channel satellites for \$200m remains to be seen.

The Nordic postal and telecommunications responsible for the allocation

Export sales pick up as industry adapts

Israel DAVID LENNON

THE first flight of a new type of executive jet, U.S. Congressional approval of funds for the Lavi (Young Lion) fighter pro-ject, and co-operation between the manufacturers of two competing "drones" have been the main developments in the Israeli aerospace industry in the

mance has also much improved since the disappointments of 1982, when sales fell sharply. One of the keys to the partial recovery, according to executives in Tel Aviv. is the speed with which Israel adapted itself to the tougher export market. The Westwind Astra business jet made its first flight in March, and deliveries are due to begin

in October next year. It is manufactured by the local giant, Israel Aircraft Industries (IAI), which has sold more tries (IAI), which has sold more than 350 aircraft of the earlier Westwind 1100 series.

The latest in the line developed from the Jet Commander programme bought from Rockwell of the U.S. in 1968, the Astra has a range of 3,000 miles and a cruise speed of

miles and a cruise speed of Mach 0.80. The company has already sold 10 Astras and re-The decision by the U.S. Congress to overrule the Pentagon and allow Israel to use \$250m in military groups for research and development cornectifutes. and development expenditures in Israel for the Lavi combat

aircraft provided a major boost to the prestigious project, which some people felt was beyond Israel's financial capabilities. This allocation made it possible for work to be pushed ahead on developing the Lavi despite the country's severe economic problems. It is believed within IAI that this has

now guaranteed that the \$1.4bn project will be completed. The prototype of the Mach 1.85 Lavi is due to fly early in 1986 and, following a Defence Ministry request to speed up the project, first deliveries of the 300 aircraft intended for the Israeli Air Force should begin

Bet-Shemesh Engines, which is to produce parts for the U.S.-

also received cheering financial news recently. This summer, 40 ing an entirely new vehicle. The capacity and resources, it would per cent of the Government agreement was made possible be unwise to ignore another ownd company's shares were following a decision by the recent development, however ownd company's shares were sold to United Technologies of the U.S., which is Pratt and RPV was needed. Whitney's parent company.

The sale price was reported to be more than \$10m. This may go some way towards easing its continuing financial woes, which are said to include an accumulated deficit of \$60m. Bet-Shemesh Engines, founded ast year.

The industry's export perfor Fouga Magister training aircraft and for Tadiran's pilotless and for Tadiran's photess drone. It also makes components for the modified J-79 engines for the Phantom combat aircraft, while in the civilian field it produces industrial gas turbiness.

> The makers of the country's two competing mini-Remotely Piloted Vehicles (RPV), IAI and Tadiran, have now formed a joint company to market their RPVs, thus ending the fierce and Air Force, and Tadiran's for the Lavi engine. Iscar exports 90 per cent of the East and State and Stat

following a decision by the recent development, however Defence Forces on what kind of quixotic it may appear at

photo and panoramic cameras linked to ground control stations. The Scout, which can carry a payload of 38 kg, has to be launched from a truck-mounted ramp, while the 30 kg payload Mastiff can also take off under its own power from a runway or a road. Both have low-earth orbit platform to a flight endurance of seven carry out several experiments.

Hundreds of Israeli comrandreos of Israeli Com-panies will work as sub-con-tractors on the Lavi project. Typical of these is Iscar Blades, which won the substantial confor the Lavi engine. Iscar ex-ports 90 per cent of the 500,000 designed launcher or one blades it produces each year.

designed Pratt and Whitney intend to develop one system to Given Israel's success in PW-1120 engine for the Lavi, replace the existing two, either carrying out projects which also received cheering financial by making a hybrid or production would appear beyond its

Israel has established a Space RPVs are used mainly for ambitious project is a space battlefield reconnaisance. They may be equipped with TV, telephoto and panoramic cameras. Amit Industries and Fairchild of the U.S.

In the first stage the Israel Space Agency is engaging in information exchange with NASA of the U.S. about the use of the Space Shuttle. The fivehours and an operating range A more ambitious goal, 10 of 100 km.

Hundreds of Israeli communications satellite and possibly a meteorological satel-lite.

> The plans also include locallydesigned and built satellites which could be launched from



A high-technology vision

Greece ANDRIANA IERODIAÇONOU

SINCE 1979, when Hellenic Aerospace Industry (HAI) began operation with manager-ial and technological help from Lockheed International and other overseas companies, it has been saving millions of dollars in vital foreign exchange by handling all repair and mainto-nance for the Hellenic Air Force, and to some extent Olympic Airways, the national car-

HAI's \$400m "state of the art" facility at Tanagra, north of Athens, is Greece's single largest industrial investment. and the jewel in the crown of the national arms industry. The Socialist Government is looking to HAI to fulfil its visions of a industry

The company also overhauls, repairs and maintains various types of aircraft from a number of foreign countries through contracts won against tough international competition. HAI has been particularly successful

does paint work on Aeritalia's G-222 aircraft. Electronics work includes the repair of Sidewinder missiles for Nato and the Hellenic Air Force.

But HAI is proudest of two recent deals with French companies, again seen as a spin-off of the Papandreou and Mitterrand governments' close ties. The one, with Snecma, has made HAI an official overhaul

era. It hopes to make the leap into aircraft assembly, and, in the long-term future, into full production.

Contracts are reported to include Egyptian C-130 "Herical agreements reached more recently for the same type of aircraft with Jordan and Canada (Canadair). A contract with the free development is expected to be the long-planned purchase of about 100 new fighters by the Greek Government to update reports from within the compaircraft with Jordan and Canada aircraft which make up Greece's and increasing workers' depresent air power.

aircraft with Jordan and Canada (Canadair). A contract with Nigeria is said to be imminent. A U.S. Air Force in Europe contract for J-79 engines was recently renewed for two years, according to HAI officials. The company manufactures door frames for Airbus Industrie and does paint work on Assitalia's

Spin-off

To offset the purchase—more than \$2bn—which has been dubbed the "buy of the century" and will be the largest single arms purchase in the strictest orders from the Prime history of the Greek armed Minister himself to run HAI according to impeccably private-invited to offer the transfer of valuable technological knowhow to HAI.

In this way the company

In this way the company hopes to participate not only in repair and maintenance but also in parts manufacture and the ssembly of aircraft.
The Government recently

announced that it has narrowed down its choice to the U.S.-made F-16 and F-18 jets and the French Mirage 2000. A mixed Franco-American purchase pack-

ATAR engines for the Middle East and other countries.

The second, with Dassaukt, gives HAI overhaud and maintenance rights for Mirage F-1 engines.

But the British-West Germanterm and short-term foreign debt of about Drs 23bn.

Hitherto, HAI officials expressed their impatience with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with what they considered a sluggish rate of technology of the Greek Air Forces with w

ship with Panavia, the manufacturing company, and through that a possible "in" on the planwith an anxious eye across the Prime Minister, Mr Andreas HAI officials insist that rela-Aegean, where Greece's arch-rival Turkey is preparing to that Greece was not yet econ-move into F-16 Phantom omically or technologically using Lockheed advisers on an

in the Middle East, HAI officials say, to Greece's close political ties with the Arab world.

Contracts are reported to Market and Market are reported to Market

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To offset the purchase—more state-run company.

To offset the purchase—more with the purchase mands with the state-run company.

Where there are fair de-

Advantage

A big advantage in ending the contract early, in the Greek view, is the saving of an esti-mated \$300m a year in Lock-heed salaries. Although HAI officials are proud that the company's Drs 1.8bn losses for 1982 were trimmed down to about Drs Ibn they are still

sidiaries for some contracts. In the tussle to disengage, Lockheed and HAI are involved in mutual lawsuits of a total

assembly after a recently ready to contemplate such an clinched deal with General involvement. "We may have our differ-bynamics. For the past two years HAI "In two years they will have has been in the throes of sub-a super-HAI set up. We have to stantial internal changes— are poor," Mr Fotilas said.

Expanding symbol of modern development

HIGH ABOVE the West Java plain lies the city of Bandung, the home of the centrepiece of Indonesian industry and symbol of its modern development. P. T. Nurtanio National Aerospa Indonesians are rightly proud

of Nurtanio's growth and development, when it started only eight years ago it had a work-force of less than 2,000. Now it employs more than 11,000 and runs extensive training programmes on all aspects of aerospace design and manu-

Nurtanio is the brainchild of Professor Jusuf Habibie, who in the mid-1970s gave up his job as an executive vice-president of Messersmitt-Bölkow-Blöhm in West Germany to return to Indonesia and found a national aircraft industry.

In its eary stages Nurtanio concentrated on the production of the CN-212 Aviocar built under licence from Construc-Aeronauticas (CASA), of Spain. More than 60 of these, 19-28-

seat twin engine turbo-prop

aircraft are now in operation, mainly with domestic users, though there have been foreign buyers, including the Thai armed forces and Air Guam. Nurtanio says a further 70 CN-212s have been ordered. It has also entered into a number of agreements to produce heli-copters under licence. Under

an agreement with Aerospatiale

of France it produces the Puma NSA-330 and the Super Puma NSA-332 helicopters. There are agreements with Bell Textron of the U.S. and MBB-Kawasaki to make the Bedl-412 and BK-177 helicopters nder licence. Lest April
Nurtanio entered into a further
agreement with MBB to produce its 109 helicopter. It
aiready manufactures the MBB
105 helicopter.

While joint ventures have tended to be dominated by the West German and Spanish at Jakarta in central Java.

British Aerospace has also been collaborating with the Indonesian Air Force over the past nine years and has sold 20 Hawk trainer jets. Professor Habible says Nur-

ranio is keen to move into the military field, but at present it is concentrating on the production of its 40-seater twin-

Indonesia

KIERAN COOKE

engine turbo-prop CN-235, a multi-purpose machine designed specifically to meet the needs of developing countries.

and is due to enter service next

Nurtanio says that more than 50 per cent of the aircraft is made in Indonesia and that it has received more than 100 orders so far, though this figure has been questioned by some in the aircraft industry.

Professor Habibie claims that the General Electric-powered CN-234 will be the cheapest aircraft of its type on the world pril market, comparing its price— her \$118,000 per passenger—with pro-the \$180,000 per passenger of It similar aircraft built in Brazil.

ture of a bigger version of the CN-235, the CN-260, which would be capable of carrying 60 passengers. Long-term plans are at Nurtanio, making aircraft in West German and Spanish passengers, congruent plans are agreements. Nurtanio has varifor the manufacture of a 110-no way inferior to those of other countries."

other companies including
Boeing and British Aerospace.
For more than two years BAe willing to assemble the European Airbus for Indonesia's flag carrier, Garuda. British Aerospace has also expressed its willingness to come to an agreement with Nurtanio for the manufacture of components or even Indonesian assembly of the new BAs 146 four-engined

jet zirliner.

its critics, some of them very senior people in Government.

Many have questioned the Wisdom of putting millions of dollars into capital-intensive projects like Nurtanio in a developing country where the developing country where the average per capita income is still below \$600 a year.

Professor Habibie, regarded

But Nurtanio is not without

by some as the supremo of Indonesian technological development and by others as a free-spending and too ambitious technocrat, has so far had the full support of President

signed specifically to meet the needs of developing countries.

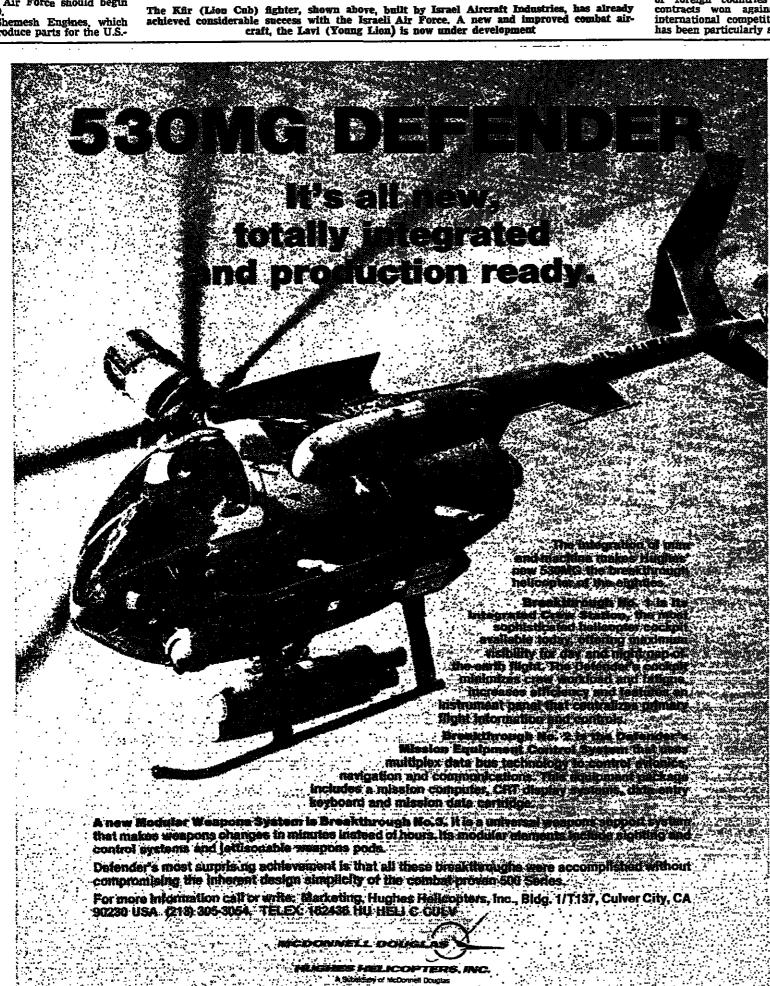
The CN-235, developed and manufactured jointly by Nutanio and CASA, is proudly referred to as Indonesia's own aircraft. It underwent its first test flight at the end of last year and is due to enter service per the coast, than the U.S. Local customers, according to Indonesian trade legislation,

can buy foreign alreraft only if Nurtanio cannot supply them, while some operators have criticised the CN-212 for its high operating costs.

Production of the CN-235, meanwhile, is behind schedule

and engineers working on it say there are still a number of technical problems to be solved. But Proffessor Habibie insists that Nurtamo and CN-235 have a bright future and he wants Indonesia to be the main driving force behind South East Asia's aviation similar aircraft built in Brazil.

Plans include the manufacture of a bigger version of the "By the time I retire," says the professor, who is only 47, "I want to see 60,000 workers.



Charles of the



Embracer's Tucano light training aircraft (above) is another contender for the RAF's big basic trainer aircraft contest. If selected, the Tucane would be built in the UK by Short Brothers of Belfast. Embracer has also built up a big business in the manufacture of small airliners. The latest in the line (right) is the EMB-120 Brasilia, a 30-passenger twin turbo-prop airliner, now under development

Embraer steps up sales drive

Brazil ANDREW WHITLEY

"THE BIGGER WE ARE, the bigger the fall," Col. Ozires Silva, President of Embraer, said recently, "We decided to leave the big losses to the big manufacturers," he added.

Despite this laudable caution about the dangers of over-rapid growth, Embraer, the Brazilian ne-controlled aircraft maker preparing for a high-speed take-off over the next few years.

As three new models—two of them wholly Brazilian-designed—come into commercial production, sales are forecast to double over this year's estimated \$170m to \$180m. Embraer says this will put it above Piper in the world mannfacturers' league table. Piper is its long standworse manusacturers league table. Piper is its long standing partner for light aircraft. Embraer also claims that it will put it on the same level as Cassna and Beechcraft, the to maintain its strategy of avoidother leading U.S. manufac-turers of light aircraft.

The state of the s

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What is a second of the control of t

oggmeth?

As the leading force in the young Brazilian aviation and aerospace industry, Embraer celebrated its fifteenth anniversary this month and is now preparing its new 30-seater turboprop commuter aircraft, named the Brasilia, for the Farnborough Air Show and a European demonstration tour.

Life translation for the formula: The translation for

fighter being developed in conjunction with Aeritalia and Aeriman planned. It also set back the scovery. But even so he expects \$600m programme—in which this year to be one of the most Brazil has a 30 per cent interest difficult the Brazilian company—by several months.

duction for 20 years. A formal—in the first year and in 1981—decision by the Brazilian and has Embraer, which is financed Italian Governments to sanction by private capital, shown a loss. Italian Governments to sanction the tooling-up necessary for full-scale production is expected

Strategy

ing dependence on any one type of aircraft, whether military or

management of the control of the con

Despite the latest delay in the joint project, both sides are pressing ahead with a programme which Sr Ozilio Silva.

Embraer is likely to end up marginally in the black, based gramme which Sr Ozilio Silva on previous years' experience of an end-year rush in tor, says could remain in prosales. Only twice in its history on previous years' exper-ience of an end-year rush in sales. Only twice in its history

> In 1985, with the first national commerce is a two-way deliveries of the Brasilia and street," its president recently the start-up of a large order told a leading Brazilian newsfrom Egypt for the Tucano, the paper. Indeed, the company is company says it will see "an heavily dependent on imports from Egypt for the Tucano, the paper. Indeed, the company is company says it will see "an heavily dependent on imports important recovery." How it in certain key areas such as then builds on that recovery will depend heavily on how Imports of equipment from Western Market 1. many of the airline operators Western manufacturers average who have taken out options on between \$50m and \$65m a year, the Brasilia turn them into contwo-thirds of typical export

so far, out of the 119 options value of the Brasilia is imported. have been confirmed—from three U.S. regional carriers. hree U.S. regional carriers. has been built up with Pratt Meanwhile, before the end of and Whitney of Canada, for ex-

the year Embraer and Short ample, for successive variants Brothers of Belfast hope the of its PT6A and PW115 turbo-Royal Air Force will have prop engines. These, Embraer selected the Tucano as its new says, are the best for its type basic trainer. Four competitors of aircraft. borough Air Show and a European demonstration tour.

At Farnborough the Brazilians will be making their biggest sales drive so far. Apart from the Brasilia, they will be showing the Tucano, their successful basic trainer/ground the successful basic trainer/ground attack aircraft, and a mock-up of the AMX, a subsonic jet to the successful basic trainer for 155 aircraft.

A recovery in the currently factured under licence in Northeract is thus considered a must for get out of the deal will be attack aircraft, and a mock-up of the AMX, a subsonic jet to the company in
thumb is regarded as one-third have been short-listed for the serve of success, the basic trainer will be mannaged.

A recovery in the currently factured under licence in Northeract in Ireland, all Embrace will be thus considered a must for get out of the deal will be attack aircraft, and a mock-up of the AMX, a subsonic jet conducted by the company in-

ment to work on other possible joint ventures. These are to be discussed by a joint planning committee after the Farnborough Air Show.

Significantly for a company for battlefield command and

whose impetus grew out of the Brazilian military's anxiety for

a nationally-owned manufactur-er, Embraer is firmly opposed

"We must not aim at self-

two-thirds of typical export earnings. Over one-third of the

A long-standing relationship

Two-way street

At its aerospace park at Sao ose dos Campos, in Sao Paulo State, there are two other small aircraft manufacturers, Nelva and Aerotec. Nelva, a wholly-owned subsidiary of Embraer, makes light aircraft, while Aero-tec is now primarily a parts supplier to Embraer.

Aerotec recently entered into a tentative joint production agreement with Siai Marchetti, a subsidiary of Agusta of Italy, to build two small military air-craft. But the refusal of the financially hard-pressed Brazil-ian Air Force to place the neces-sary minimum order has shelved the project.

A similar fate may also befall the plans of Sikorsky of the U.S. to make helicopters in Brazil, probably in association with Embraer. The Brazilian Air Force urgently needs a new helicopter, but the resources to finance its construction are apparently not available at pre-

The only existing helicopter manufacturer in Brazil, Helibras, is a joint venture between Aerospatiale of France and the Minas Gerais State Government. Its small factory makes the Esquilo light helicopter, but The Bandeirante, Brazil's despite the potential demand in first home-made aircraft and a Brazil it has not been a great success around the world success.

--even though some components are likely to be purchased from the U.S.

A significant aspect of Japan's orbiting space station. Mr planned emancipation from U.S. technology is that it could then cease to consider itself restricted by U.S. views in respect of launching satellites for third countries or exporting satellite technology and equipment.

Japan's wish to develop its own satellite technology is causing some grumbles among lames Beggs, chief of the U.S.

Japan JUREK MARTIN

"H-2." According to the govern-ment's planning, the H-2 will

be ready for launching in 1991-1992 and capable of lifting a

2,000 kg satellite into geo-stationary orbit.

Development Agency (NASDA), the H-2 has a maximum satellite

Major contractors

to provide major contracts for the big diversified Japanese

engineering concerns which have developed their aerospace capacity often in co-operation with U.S. manufacturers. The major contractors for the H-1

programme are Mitsubishi Heavy Industries, Ishikawajima-

The H-2 programme is likely

The H-2 will be Japan's most powerful rocket by a substantial margin. The standard satellite launch-vehicle currently used by Japan's National Space

Satellite technology

brings benefits

JAPAN is pushing ahead with an ambitious space programme causing some grumbles among trading partners who see aero-space as one of their few oppor-tunities to redress their other-wise large bilateral trade defiaimed at establishing its own technology and production facilities for satellite construc-tion and launching.

Last month the Government's Space Development Council finalised details of a new Y200bn rocket programme, the

the European satellite con-sortium, Ariane/Aerospatiale, secured the help of no less than four ambassadors last month to this year. lobby the Japanese Government into buying a weather satellite built by Aerospatiale of France and launched by Ariane.

the H-2 has a maximum satellite payload of 350 kg.
Its immediate successor, the H-1 rocket, is now under development for planned launches beginning in 1983 and will be capable of carrying a 550 kg satellite into geostationary orbit.

they wished the satellite pro- liners.

posal to be regarded as a "test- Jana case" of Japanese Government willingness to buy cost-competitive major capital goods from foreign suppliers.

Neither the price nor the politics of the European proposal won over Japan's Foreign Ministry, which told the lobbying Ambassadors that satellites were an area in which Japan wished to substitute its own capability for foreign depen-

Harima Heavy Industries, Nissan Motor Company, Japan dence.
A Science and Technology
Agency official recently said Aviation Electronics Industries, and NEC Corporation. that Japan's desire to be inde-Whereas rockets up to and including the H-1 have relied on U.S. technology from companies such as McDonnell Douglas, Rockwell International, motivated by more than strate-gic considerations. He added that Japan was dissatisfied with the poor record of foreign satellite technology and believed it could make more reliable and TRW, officials in Tokyo claim that the H-2 programme represents the emergence of true Japanese space technology

James Beggs, chief of the U.S. National Aeronauties and Space Administration, visited Tokyo last March.

If Japan does take a slice of the project, its investment could be as much as Y300bn. Further indications of Japanese intentions are expected later

Crucial step

Meanwhile, Japan's civil avia-The European consortium tion industry has recently wanted to fill a "slot" in taken what may prove to be a Japan's satellite programme for crucial Government-guided first Japan's satellite programme for a 1989 launch. It argued that it could supply and launch the satellite for about Y14bn, compared with what it claimed bevelopment Corporation, a would be a Y20-21bn bill for Japan's own planned launching of a satellite built by Hughes Aircraft of the U.S. under prime contractorship of Nec Corporation and launched by Japan's own H-1 rocket.

European diplomats also said they wished the satellite pro-

Japan Aircraft Development (JAD) already co-operates with Boeing in the production of the B767 airliner, to which it subscribed 15 per cent of develop-ment costs and for which it supplies 15 per cent of the parts. The Japanese consortium had no project management role, however.

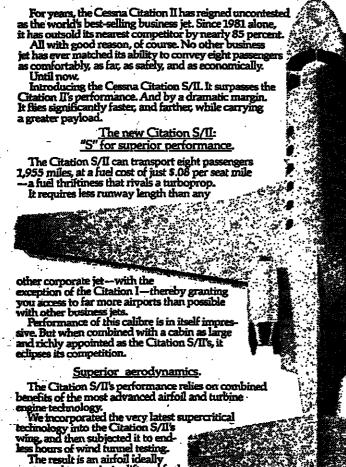
JAD is committed to a 25 per cent stake in whatever emerges from the new partnership with Boeing and will be actively involved in planning and market-ing. The partnership will not pendent of foreign satellites was necessarily result in a major manufacturing project, how-ever. It is starting off at the

feasibility study stage.

But it enjoys the high expectations of its Japanese investors and of the Ministry of equipment itself.

One piece of foreign technology that does whet the possible options before advising Japanese appetite, however, is the proposed U.S. permanently its most hopeful prospect.

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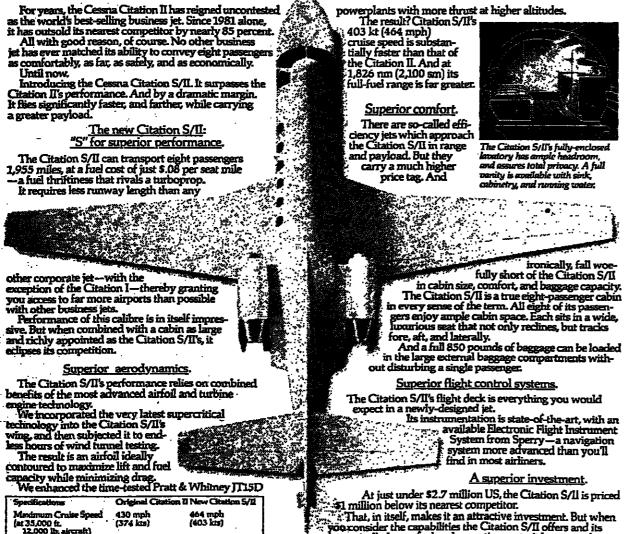
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Range (6 persengers, 1,720 mm; maximum crusse speed) (1,300 nm)

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conditioning, full blind-flying instrumentation and NAV/COMM equipment.

But jet-like handling is the Tucano's strongest feature: the airframe is an all-new design married to the 750

SHP PT6A-25C turbine to render jet-like characteristics. A singlelever controls both engine power and propeller pitch, acceleration at take-off is brisk and initial rate of climb exceeds 3000 ft/min, while level cruise speed reaches up to 250Kt. Precise and crisp controls in a +6G and - 3G airframe enable very sharp hesitation rolls and simulate the powered controls of an operational jet. The Tucano covers a wide training syllabus, from primary through basic, up to advanced and weapons delivery stages, and can carry up to 2200 lb. (1000 Kg.) of ordnance at four

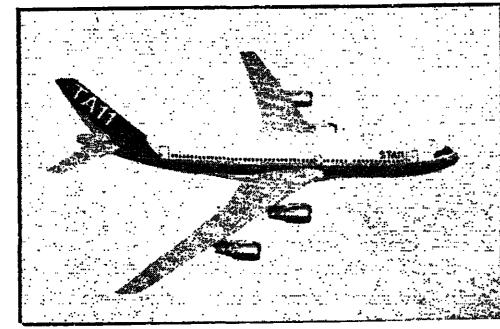
underwing hard points.

These are some of the features that prompted the Royal Air Force to place the Tucano on the short list of 4 contenders for the replacement of the Jet Provosts.

For further information: CSE Aviation Ltd. - tel. (86-75) 4321, telex: 83204 - Oxford - England or Embraer (Brazil) - tel. (123) 22-7070, telex: (391) 1133589.







Seeking to extend skills

Australia MICHAEL DONNE

ALTHOUGH the Australian air-craft industry is relatively small, it is well skilled in modern aerospace techniques.

This knowledge has been This knowledge has been derived not so much from the limited production of indigenously designed aircraft but more from the extensive experience in sub-contract, component manufacture, overhaul and other support work for a wide variety of foreign-designed civil and military types. civil and military types.

The Australian industry's policy is now to expand wherever it can. The aim is to increase its skills in design, deincrease its skills in design, de-velopment and manufacture so and has had only a limited air-as to win a share of the substan-tial workloads likely to occur in Nomad light transport and tial workloads likely to occur in the manufacture of components

An incentive for this policy is the knowledge that Japan and countries in South-East Asia—such as Indonesia and Singapore—are sharpening their own aerospace skills with a view to sharing the big world markets anticipated in the long term.

The Australian Aircraft Consortium, to develop a new basic trainer for the Royal Australian Aircraft called the Aircraft called the strength of the Royal Australian Aircraft called the strength of the Australian Aircraft constitution of the Royal Australian Aircraft constitution of the Royal anticipated in the long term.

Australian industry primarily comprises three

Corporation, of Port Melbourne, Victoria, currently a primary supplier of equipment and ser-vices to the RAAF;

The Government Aircraft Factories, of Fishermen's Bend, Victoria, responsible for the Nomad light transport aircraft, and manufacture of parts for overseas civil aircraft such as the F-28 Fellowship and also for military aircraft used by

the RAAF: Hawker de Havilland Austra-lia, of Bankstown, New South Wales, primarily involved in the provision of sub-contract manufacture, overhaul, modification and repair services to the Australian Defence forces and overseas countries.

Hitherto the industry has been involved primarily in subthe manufacture of components utility aircraft, in various civil for the new generation of civil and military versions, has been airliners now planned in Europe one of the major products in recent years.

Airtrainer) and also for export.

The basic aircraft called the new version of the multi-role Lynx, the Lynx 3, will be Pratt and Whitney Aircraft of suitable for this role; but it

After launching the A-10, the Australian Aircraft Consortium submitted to the RAF in Britain its ideas for a new version, the A-20 Wamira II, as an entry for the RAF's own basic trainer competition to find a successor to the ageing Jet Provost.

Decisions .

The Wamira II is now one of four aircraft on the RAF's of four aircraft on the RAF's short list, although neither that aircraft nor its predecessor A-10 have yet flown: Serious discussions on its possible procurement and production are in progress, but no final RAF decisions have yet been taken. As part of the Australian plans, extensive discussions have been held with Westland of the UK with a view to Westland undertaking production of

land undertaking production of the Wamira II in England if that aircraft is selected for the RAF. Westland itself, anxious to expand its own markets in the Far East and South-East Asia, has offered Australia an extensive stake in the production of its own Westland 30 helicopter, with a view to winning an order for helicoptors for the Royal Australian Navy.

Initially Westland helicyes

The Commonwealth Aircraft Canada PT6A turbo-prop, is due also envisages the Westland 30 to be rolled out later this year as having a major role in and to fly early next year, with first deliveries to the RAAF in the later than the

East. Earlier this summer a new joint company, AAC-Westland, was set up in the UK with a view to exploiting these ideas as well as being responsible for Wamira II production if that aircraft is selected for the RAF.

Besides these activities the Australian industry is interested in participating in other imporand the was named over tant new international civil aircraft developments, including a small stake in the A-320 Airbus. An agreement on A-320 work was recently signed with British Aerospace. The industry is also below wood by the U.S. Air Force in 1942.

Prove is also being wooed by the U.S...
with a view to participation in
future civil aircraft manufacturing programmes.

turing programmes.

The experience already gained by the Australians in making parts for overseas transport aircraft, such as the Dutch Fokker F-28 Friendship and the Boeing 727 jet airliner, will serve the industry well in the agreement to build parts of the Airbus A-320.

The size of the Australian industry's stake in that venture is small, perhaps no more than

is small, perhaps no more than 2 to 3 per cent, but it will nonetheless be significant in helping the primary manufacturer to win sales in the Far East and South-East Asia.

Seeking an export business

India JOHN ELLIOTT

INDIA is exhibiting alreraft at Farnborough for the first time in 12 years. Two trainers, including the HTT 32 turbo-prop, which made is maden flight last month, will demonstrate the country's determination to prove internationally that it can

prove internationally that it can design, develop and make its own aircraft.

This capability is about to be tested to a greater degree than ever before on a new light combat aircraft project to be started soon for the 1990s, probably in collaboration with Western European companies.

probably in collaboration with Western European companies.

The exhibits, staged by India's public sector manufacturer, Hindustan Aeronautics (HAL), will be more for prestige than sales.

India is not in the export business yet, although last year it won its first significant order. It sold eight of its Chetak helicopters (the French Alouette III made under licence) to the Soviet navy, and is hoping to Soviet navy, and is hoping to

sell more.

The Indian aerospace industry is estimated to employ about 75,000 people, producing a range of aircraft and avionics as well as equipment for the country's own space programme.

HAL employs 40,000 at eight locations and is the major organisation involved. Founded in 1940 is built in founded in 1940, it built its first aircraft — a Harlow trainer—a year later. But it was handed over to the U.S. Air Force in 1942

By last year it had built about 840 of indigenous design and 1,580 of foreign design, with sales—almost all to the

But other pressures get in the way of this ambition. In particular it is determined to equip itself as fast as possible with modern weapons, especially now that the U.S. is strengthen-



Final assembly of a Jaguar jet strike aircraft of the Indian Air Force at the Bangalore plai of Hindustan Aeronautics, HAL undertakes the licence production in India of the Enropea (Sepecat) designed Jaguar

requirements.

There is also always the

There is also always the digenisatic counter-attraction of buying in India.

"off-the-peg" from the Soviet Union on very cheap terms. The Soviets have opposed India's defence purchases from Western Europe in recent years.

India is now believed to be finalising the purchase of Soviet Mig 29 fighters and has its eye on the Mig 31. It has been making Mig 21s since 1963 and in the "Bis" version since 1976.

1976.

The Ministry of Defence—which stoutly denies that HAL is inefficient or has production problems—says that more than 2,500 items out of a total of 2,893 have been indianised on the Mig 21s.

Now it has finalised arrangements with the Soviets to start

assembling the Mig 27 airframes at its Nasik plant, north-east of Bombay, and engines at Koraput, in the eastern state of Orissa.

ing Pakistan's defence capacity with F16 fighters and other equipment.

HAL also suffers from the Indian public sector's often stifing bureaucratic inefficiences and it cannot design or construct aircraft fast enough to meet the country defence requipments.

HAL also suffers from the Indian factory in Banga-lore last year and nine are changes of staff.

But the most ambitious project is the light combat aircraft various amendments, now proons which the Indian Government's combining all its various aircraft made in Britain and the assembly with progressive in the including up. Four the labelled "Indian" although development work will be done in both countries with exchanges of staff.

But the most ambitious project is the light combat aircraft various amendments, now proons which the Indian Government is combining all its various aircraft made in Britain and the assembly with progressive in the indian of the labelled "Indian" although development work will be done in both countries with exchanges of staff.

assembly, with progressive in-digenisation, of a further 76

in India.

By 1987-89 it is planned to produce the final 31 Jaguars with almost every component made in India.

Option

With these Russian and British fighters made in India, the Government decided in June not to go ahead with an option to manufacture the French Mirage 2000, having already pur-

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ties, including universities, for the first time. It wants an air-

the first time. It wants an aircraft to fly as a protitype in the early 1990s and to last for 20 to 25 years.

The Defence Ministry intends that HAL will collaborate with foreign companies for key parts of the development and is now studying proposals from British Aeromace, Dessault of France, and MBB and Dornier of West Germany.

It will probably choose to col-

It will probably choose to collaborate next year on specific items from more than one of India has recently completed these companies. It is also receiving blandishments from the nier 228 light transport aircraft under licence from West Germany for the air force, coast with Western Europe on such a guard, navy and the provincial airline Vayudoot, initially 100 are to be made.

pressige project.

If both projects are kept on schedule, the light combat aircraft will be made in the Bangaare to be made.

Having produced 400 French craft will be made in the Bangati its Nasik plant, north-east of Bombay, and engines at Korabut, in the eastern state of Drissa.

Meanwhile, its Jaguar output, MBB of West Germany. It will begin taking shape.

